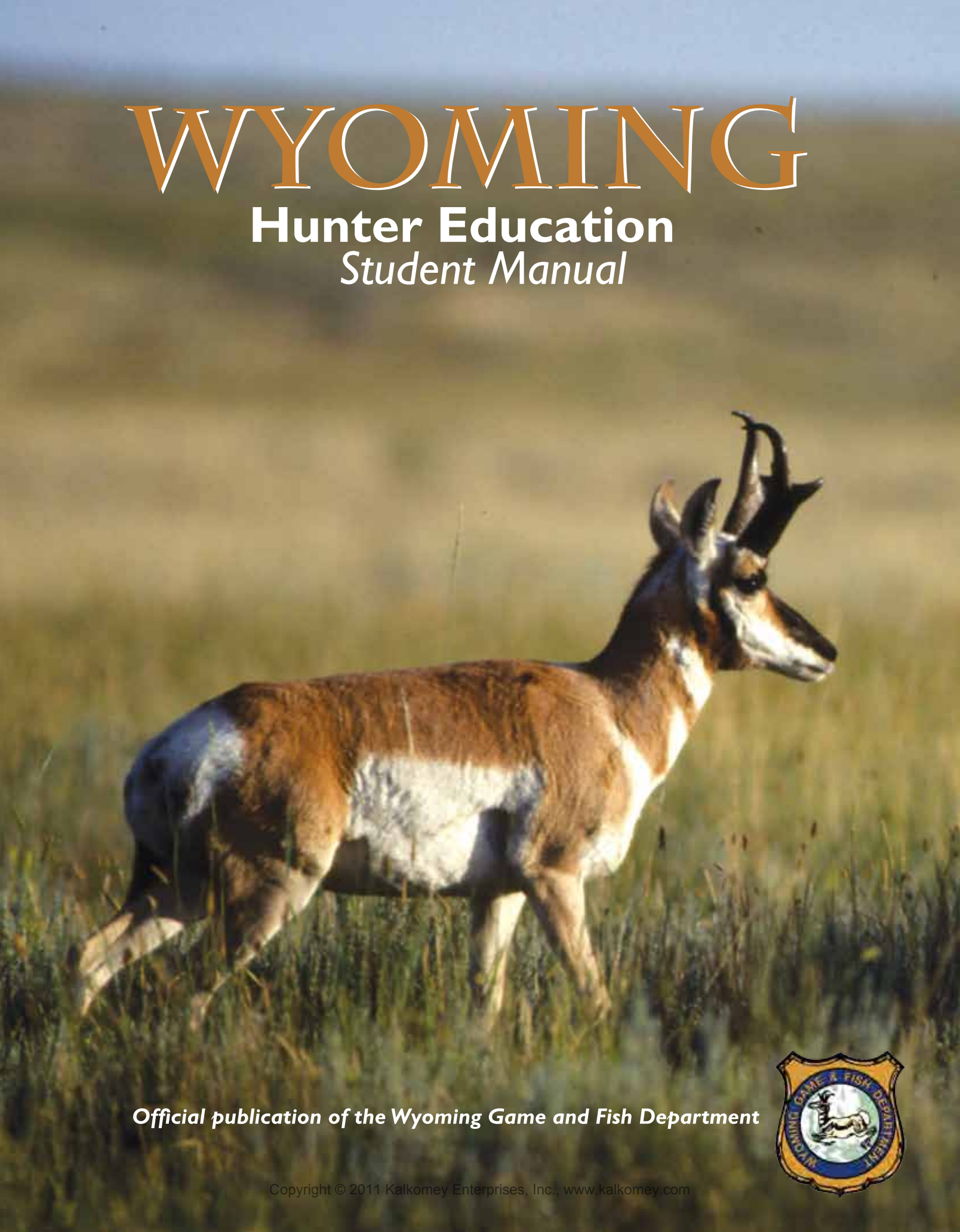
WYOMING

Hunter Education

Student Manual



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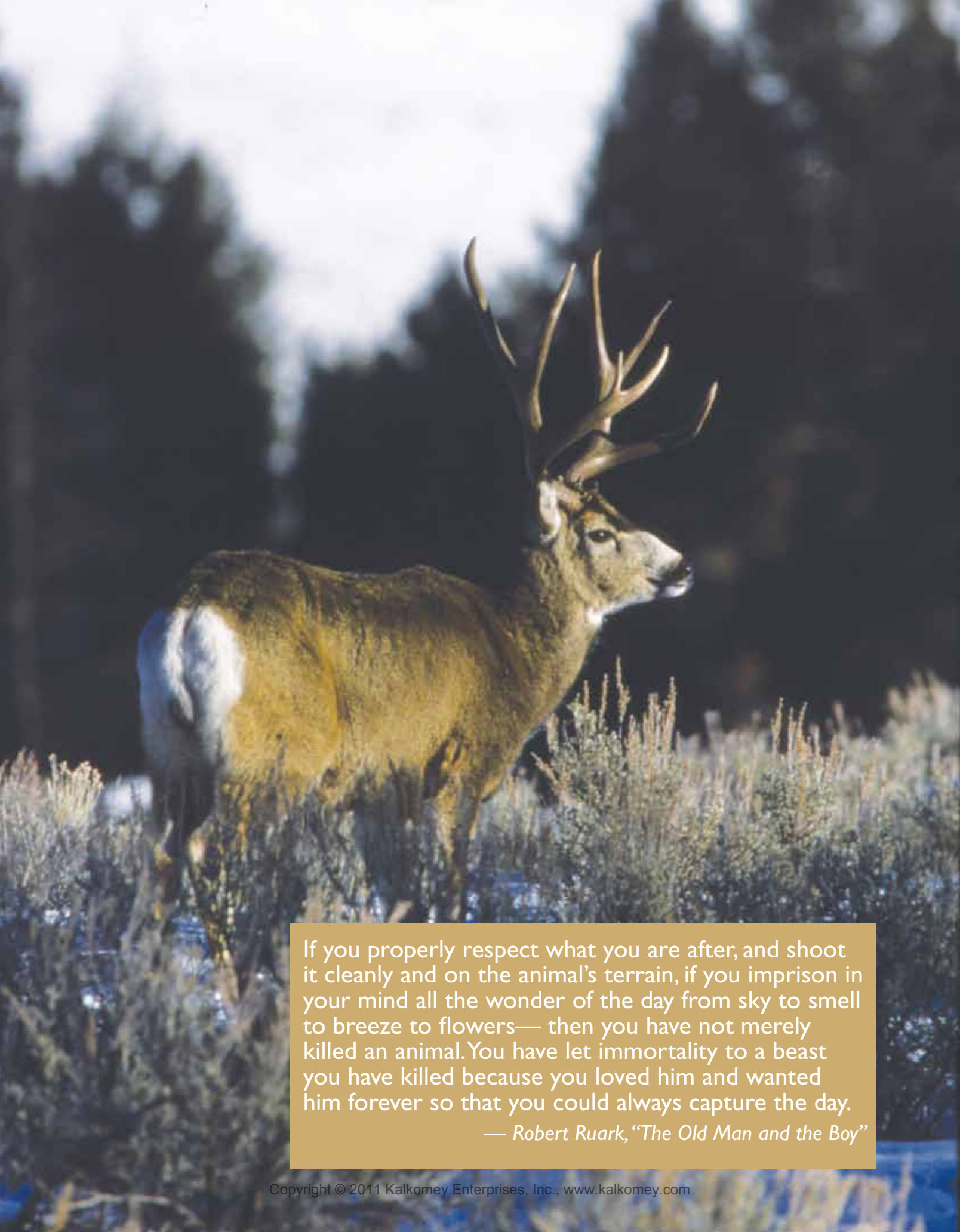

If you properly respect what you are after, and shoot it cleanly and on the animal's terrain, if you imprison in your mind all the wonder of the day from sky to smell to breeze to flowers— then you have not merely killed an animal. You have let immortality to a beast you have killed because you loved him and wanted him forever so that you could always capture the day.

— Robert Ruark, "The Old Man and the Boy"

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WYOMING HUNTER EDUCATION PROGRAM

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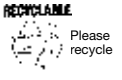

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Introduction to Hunting and Hunter Education

Welcome to the Wyoming Hunter Education Program. You are about to join the millions of people throughout the country who enjoy the tradition of hunting, but above all, respect and work to conserve wild animals and wild places.

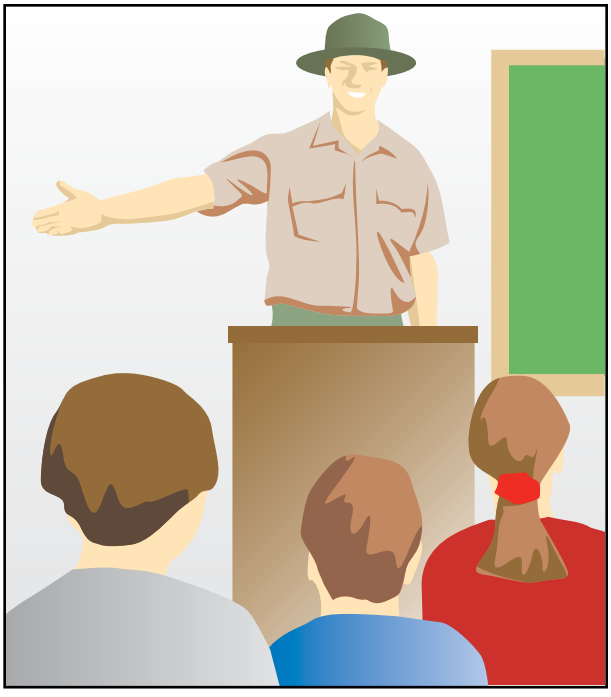
Hunting has always been a part of human life. For most of their history, humans depended on hunting for their survival. No other form of human activity has a longer tradition. For this tradition to continue will require safe, responsible, knowledgeable hunters who are dedicated to keeping sufficient habitats for wild animal populations.

The first hunter safety courses were designed over 50 years ago with the main purpose of reducing hunting accidents. All states now have hunter education courses, with over 25 million graduates since the programs were started. A decrease in hunting accidents of well over 50% shows how effective these programs have been. Hunting is statistically safer than almost all other forms of recreation.

While the major purpose of hunter education programs is still the prevention of hunting and firearm related accidents, more and more emphasis is being placed on improving knowledge about the heritage of hunting. The importance of the young hunter developing a sense of ethics and responsibility is stressed. And both the first time and veteran hunter are encouraged to become involved in all matters related to hunting, wildlife, and the environment. Responsible, ethical behavior by hunters, and personal involvement in the community will be essential to the future of wildlife and the survival of hunting.

Hunter education courses in Wyoming are sponsored by the Wyoming Game & Fish Department, and by similar wildlife management agencies in other states. The major sources of funding for these agencies are from sales of hunting and fishing licenses and from federal excise taxes on hunting and fishing equipment.

The cost of hunter education courses would still be prohibitive if professional instructors had to be hired. In Wyoming, there are over 450 volunteer instructors, training over 5,000 hunter education graduates each year. These volunteers donate their time, ability, and effort to share their knowledge and experience with you and others like you. Without the efforts of these volunteers the programs in hunter education would not be affordable or possible.



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1 Hunter Responsibility

Hunter Responsibility—Key Terms

Code of ethics (Hunter's Code)—A set of unwritten rules based on respect for what is safe and fair.

Ethics—The set of principles, values, and behavior that you think is correct.

Fair chase—Use by the hunter of techniques and/or equipment that allows the quarry a fair chance of escape.

Image—The way others see you because of your actions.

Law (statute)—A standard of custom or action enacted by a legislative branch of government and enforced by a civil authority

Privilege—Exceptional benefits which are allowed to individuals or groups and can be controlled or withheld.

Private land—Land that is owned by an individual or group of individuals.

Public land—Land that is owned by citizens through the government.

Regulation—A rule prescribed by a government agency which carries the weight of the law under which it was written.

Responsible—Answering for or accounting for your actions

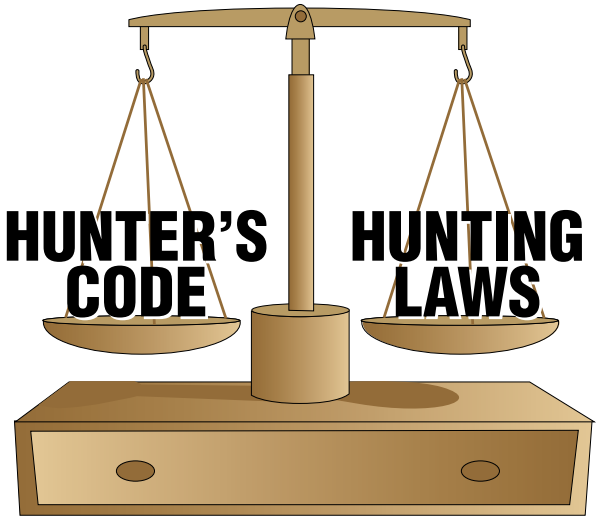
Rights—Powers to which a person has a just claim. Unlike a privilege, a right cannot be taken away from you.

Sportsman/sportswoman—A hunter who obeys all the written and unwritten rules and regulations. A hunter who enjoys the total hunting experience.

Introduction

What do you think you should always plan to take along when you are headed out on a hunting trip? The first things you would think of are probably your gun and ammunition, license, favorite hunting clothes (some of it the required blaze orange), regulations, maps, and all the gear we associate with hunting.

There are some other things you will learn about in this class that every hunter needs to always have with them that are equally important. These are a good "code of ethics" and "a respect for the wildlife and where they live" (their habitat). You will develop an appreciation for the heritage and privilege of hunting in this country that is not possible in most areas of the world. And you will learn there are many responsibilities that go along with the privilege of hunting.



A hunter's code is as important as hunting laws.

By learning and practicing these concepts you will not only be a better, safer hunter, you will enjoy the hunting experience more and respect yourself as a hunter. You will also be demonstrating to others, both hunters and non-hunters, that you are a caring, ethical, and safe hunter. This will be essential to help erase the "slob hunter" impression left on many people by some hunters in the past who disobeyed laws or acted unethically.

History and Heritage of Hunting

If you ask several hunters to explain why they hunt, you will hear different reasons. For many, it is a family tradition that has been shared for many years. Others may say it's to relax and enjoy nature. Some like the exercise and the sense of adventure and accomplishment in using hunting skills they have developed over the years. Working with companion hunting dogs or pack animals is important to many. "Filling the freezer," and

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the dinner plate, with flavorful game meat is a common reason. Most hunters also know they are aiding in the management and conservation of wild animals.

Even though it's easier, and may even cost less, to buy food and clothing at the store, many people go hunting for the same reasons others tend gardens and make their own clothes. They enjoy the experience, not just the end product.

Hunting is a tradition that has been handed down through generations since earliest humans. As more fossils and relics of ancient humans are found, they show that humans did not become hunters, they started out as hunters. Hunting was their life and how they survived. Even though most people do not depend on hunting for survival today, the heritage is still present.

When firearms were invented the killing of game animals became easier and safer. As people began to move into new areas during the early years of this country, some people (called market hunters) would kill large numbers of animals to sell in the cities. Some others would kill many animals for "sport" and not use the meat at all. As human populations increased and spread out, there was also less natural habitat for animals. All these factors led to a big decrease in numbers, and even extinction, of many wild animals.

Sportsmen of the late 1800s saw how the animals were being lost and began to demand the first laws and regulations to protect game animals. Many of the first laws were made to limit how people could hunt and what kind of equipment they could use. Later laws were made to protect wildlife even more by setting hunting seasons and limiting the number and types of animals which could be killed.

Until this point in history, many people believed it was their ***right*** to take any of the nation's natural resources (including wildlife) for their own personal use. *Rights* are provided to each citizen by the constitution and cannot be taken away. They give people certain powers, such as the right to a fair trial and the right to own property.

Several court rulings, along with the new laws being passed, showed that hunting is a ***privilege*** instead of a right. A *privilege* is an extra benefit given to a person. It is only given when certain conditions are met and can be taken away if those conditions are not met. Some conditions for hunting are taking a hunter education class, having a license, only hunting at certain times and obeying game laws.

The laws about how people could hunt, and what equipment should be used, were beginning to describe the subject that we now call "*fair chase.*" To the responsible hunter, fair chase means that the hunter uses methods and equipment that allow the animal a fair chance to escape.

Hunting with a spear would probably always allow the prey to escape. At the opposite extreme would be shooting a penned up animal; the kill would be quick

Rights and Privileges

Below you will find several subjects listed. Are they rights or privileges? Two have been done for you. You decide about the rest. Talk with your instructor about why you chose your answer.

Subject	Right	Privilege	Why?
Freedom of religion	X		Guaranteed by the Bill of Rights.
Voting			
Driving a car		X	License can be revoked for violations.
Trial by jury			
Joining in a club			
Owning a firearm			
Hunting			

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and clean, but the animal obviously has no chance of getting away. Between these extremes are a lot of hunting techniques and equipment that give both the hunter and the game animal a fair chance at success.

As better firearms and hunting equipment are developed, fair chase when hunting becomes even more important. If the hunter uses so much technology and equipment that the animal can never get away, the real enjoyment and heritage of "hunting" is gone, and it becomes more like "game killing."

What is considered to be fair chase varies a lot in different parts of the country, and even between different hunters. New inventions designed to improve the hunter's chances of success are very common. For instance, riflescopes are used by most hunters since they increase the chances for a clean kill. Other techniques, such as shooting big game from aircraft, are disliked by almost all hunters. Between these extremes are such things as infrared aiming devices, heat scanners, range finders, night vision equipment, ATV's, two-way radios, and many others. As long as they are legal, the types of equipment and hunting techniques you think are fair chase is your personal choice.

Hunting laws are meant to preserve wildlife—Hunter ethics are necessary to preserve hunting.

For you to decide what you think is fair chase, and for making many other decisions while hunting and in daily life, you will depend on your personal "*code of ethics.*" Ethics are very important in all parts of your life. The word *ethics* means the actions, behavior, and conduct that you believe is the right thing to do. Aldo Leopold, an important conservationist, describes ethics as "doing the right thing when no one is watching, even if the wrong thing is legal." There are not enough laws to describe the right action in all possible circumstances. So when you are in a situation where you have to make a decision on what is right or wrong, and no one else is around, you have to rely on your personal "code of ethics".

Whether you realize it or not, you are continually developing a personal code of ethics for all parts of your life, not just hunting. The development of this code is based on your own personal values and is influenced by what your family, friends, and classmates think is right. The type of community you live in and how you act in that society are also important. Your personal ethics will show your respect for other people and their property, animals, the environment, and your personal image of yourself.

Code of Ethics

1. I will consider myself an invited guest of the landowner, and get permission before using their land.
2. I will obey rules of safe firearm handling and encourage others to do so.
3. I will obey game laws and regulations and insist that my companions do so as well.
4. I will acquire good marksmanship and hunting skills to ensure clean, sportsman-like kills.
5. I will support conservation efforts to ensure hunting in future years.
6. I will help other hunters learn skills and attitudes necessary to allow them to become true sportsmen.

Which sign would you rather see?

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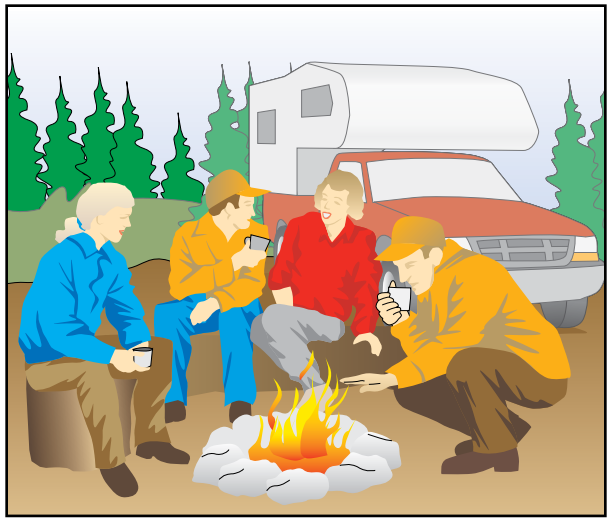
Hunter's Responsibilities

Within your personal code of ethics, and that of every hunter, should be several general responsibilities that are part of the tradition of hunting:

Responsibility to the animal and habitat

You should study and learn as much as you can about all wildlife, both game and nongame, but be especially aware of the habits and habitats of the animal you are hunting. Learn about the environment and treat all land, public and private, with care to prevent disturbance. Know and obey all hunting laws and regulations, and report any observed violations. Define for yourself what constitutes fair chase and practice it in all hunting.



Responsibility to the landowner or land manager

Always seek permission to hunt well before the season begins and not the morning you want to begin hunting. Respect the privacy and safety of the landowner and leave the property in as good, or better, shape than you found it. Leave all gates as you found them, carry out all trash (yours and any you find), and report any damage or vandalism you notice to the owner. Since you are a guest of the landowner, act like a guest and show appreciation for permission to use the land.

Responsibility to other hunters

Always respect hunting areas and zones of fire of others in the field. It is especially important to be sure of your target, and what is in front of, or beyond it, when other hunters are in the same area. Respect the fact that the other hunters (or non-hunters) have just as much right to be there as you do. Treat other hunters with the same courtesy you would expect to receive.

Responsibility to non-hunters

As a responsible hunter you should always project a courteous and positive public image. Change from bloody or dirty hunting clothes to clean ones and dress properly in public. Show that you care about wildlife both in what you do and what you say. Tell hunting stories only to those wanting to hear them, and not so loudly that they may upset others around you. Never display dead game on the hood or roof of any vehicle, hanging out of the back of the pickup, or in public in any manner that may offend someone.

Responsibility to yourself

You have a distinct responsibility to yourself as a hunter to improve your hunting skills and continue to learn new ones. Know your abilities and limitations; learn and practice the self-control it takes to remain within these limits. Before taking any action, ask yourself:

- Is it legal?
- Is it safe?
- Is it sporting?
- Is it smart?
- Is it the right thing to do?

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Pride of Sportsmanship

Sportsmen have contributed most of the time, effort, and money that have been needed to rebuild and maintain healthy populations of animals. As you begin to understand this long tradition of service to wildlife and conservation, a sense of pride will begin to develop about becoming a hunter. By reading wildlife publications, attending conservation meetings, joining sportsmen's clubs, and other activities relating to wildlife and the environment, you can learn more and show your concern for the hunting tradition. Be proud of the personal code of ethics you have developed.

Five Stages of a Sport Hunter

What is a successful hunter? Your age, experience, and the actions of hunters around you help form your ideas of what a successful hunter should be. Look at the stages below. All hunters do not pass through each of the stages or may not pass through them in the exact same order. Which stage best describes you?

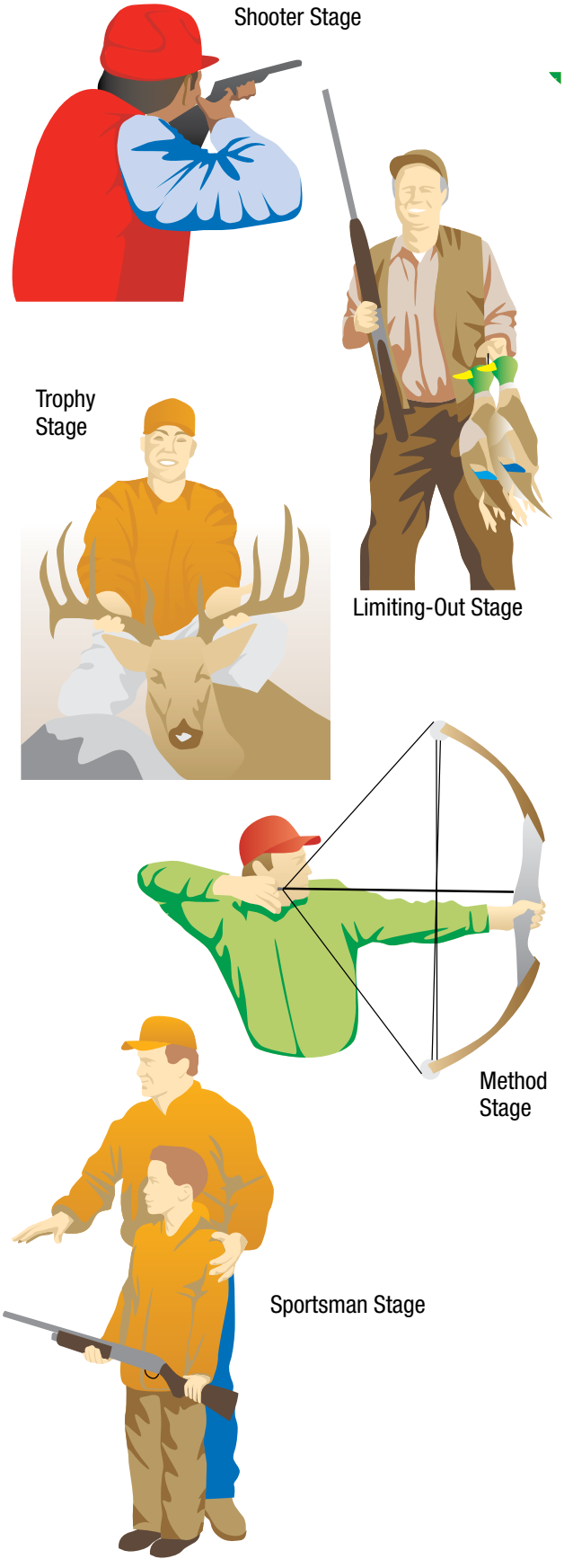
Shooter Stage—This hunter thinks of "good hunting" as meaning "much shooting." Beginning deer hunters tell of the chances they had to shoot. Missing game is not as important as pulling the trigger. Hunters in this stage may be dangerous hunting partners.

Limiting Out Stage—These hunters still talk about enjoying shooting. More important to them is the number of birds or game animals shot. Limiting out is the hunter's goal. They may want to limit out more than safe behavior allows.

Trophy Stage—These hunters try to shoot only certain game. They look for one special deer and may travel far to find their trophy. Getting a lot of shooting is now less important.

Method Stage—In this stage, hunting has become very important to the hunters. They still want to take game, even limit out, but more important to them is how it is done. These hunters study the habits of their game. They choose special equipment, which may be primitive, such as the bow and arrow or black powder. Equipment use and the best hunting skills mark this stage.

Sportsman Stage—After many years of hunting, these hunters enjoy being with friends in the outdoors more than taking game. They enjoy the total hunting experience.



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How Do People See You?

Situation

You are hunting pheasants with a close friend when a red-tailed hawk flies overhead. Your friend shoots the hawk on purpose.

What would you do?

Situation

You are walking in the woods and you notice litter on the trail. You did not leave any litter yourself.

What would you do?

Situation

You are deer hunting on public property that is next to a large piece of fenced private property. A large buck walks into the meadow you are hunting in, and you shoot it. The buck jumps the fence and runs 100 yards into the private property before it falls and dies.

What would you do?

Situation

You are hunting elk in a National Forest. While walking through a large stand of timber, you come upon a cow elk that is wounded and cannot get up. You are licensed for a bull elk.

What would you do?

Public View of Hunting

Surveys show that about 10% of Americans are actively involved in hunting. Roughly the same number can be called "antihunting" to some degree. Most of the remaining 80% who are "non-hunters" are in favor of hunting. This is the group who may actually determine the future of hunting. Their opinions are often based on what they see or are told about hunter behavior.

Groups of people are often judged by the actions of just a few. All hunters may be judged as slobs, poachers, or worse because of the publicized actions of a few individuals. Every hunter has to present a positive public image so other people won't think that hunting is wrong. This can only be done by demonstrating a good code of ethics in all your actions.

Hunters should also show a sincere concern for all animals and for the environment. Every effort must be made to educate the public about wildlife management, conservation practices, and habitat needs of all animals. It is important that others know the critical role hunters and other sportsmen have played, and continue to play, in the restoration and management of the wild animals and wild places we now have.

Landowner respect and private property rights

Since very few hunters own the land where they plan to hunt, it is important to know about, and respect, private ownership of land. Even if you do not plan to hunt on the private land, you will often have to pass through it to reach public lands. Many times public and private lands are closely mixed. Owning land in the country is the same as if you own a house in town or a vehicle. If somebody wants to enter your house, or use your vehicle, they must get your permission. Similarly, you must get permission from the landowner to enter the private land. Entering another's property without permission constitutes trespass, a crime for which you can be arrested and fined or imprisoned.

You are more likely to get permission if the landowner has enjoyed his experiences with hunters in the past. Just as you would expect in your home, the landowner expects the "guest" to respect the property and act in an ethical, courteous manner. One of the common reasons for farmers or ranchers to close their land to hunters and the general public is the poor behavior and misuse of the land by previous hunters, anglers, or other outdoor users.

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Responsible Land Use

Whether they are hunting on private or public land, everyone using the outdoors is responsible for protecting the land from damage. No matter what your favorite activity, all outdoor users must respect the rights of others to enjoy their activities and share the land and water without conflict. All who use and enjoy the outdoor environment must treat the land with respect and cause as little impact as possible.

The "Tread Lightly!"® Pledge

Travel only on designated routes.
Respect the rights of others.
Educate yourself.
Avoid streams, meadows, wildlife, etc.
Drive responsibly.

tread lightly!® ON LAND AND WATER

Travel only on the trails, roads, or land areas that are open to vehicles or other forms of travel.

Respect and be courteous to other users who also want to enjoy the lands you are traveling. Be considerate and honor their desire for solitude and a peaceful backcountry experience. Noisy motors and loud behavior are not acceptable and detract from a quiet outdoor setting. People go to the backcountry to escape such interference.

Educate yourself by stopping in and talking with land managers at their office. They can tell you what areas and routes are open for your activity.

Avoid sensitive areas with your vehicle. When hunting season is underway, rain and snow typically saturate the ground, making soil surfaces soft. Churning wheels and heavy vehicles can cause damage to plants and ground surfaces. Stay on designated roadways, especially on hillsides, streambanks, lakeshores, and meadows.

Drive and travel responsibly to protect the forest, land, and water that you enjoy as a sportsperson. One of the reasons you are a hunter is for the opportunity to enjoy the beauty of the vast scenic regions of our country.

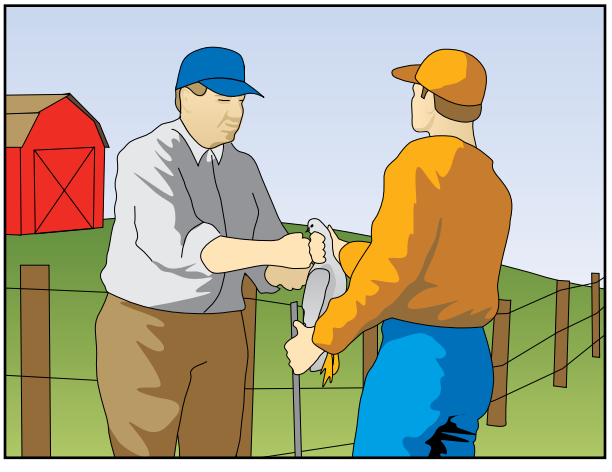
Why responsible land use is becoming more important

Outdoor recreation and use of public land is steadily increasing as larger numbers of hikers, campers, anglers, hunters, and other outdoor enthusiasts enjoy our resources. With the development and popularity of "all-terrain" vehicles (ATVs) and off-road vehicles (ORVs), motorized access farther into the backcountry is also increasing. Along with this increased access are added obligations to the environment, to safety, and to others.

Safe, responsible ATV or ORV users will follow all regulations about the registration and safe operation of their equipment. It is always your responsibility to find out if specialty vehicle use is legal and permitted in your area. Know and understand the meaning of trail signs and markings.

Many types of wilderness vegetation are surprisingly delicate and can be easily damaged or destroyed. Always pick your route of travel with care. All tires of wheeled vehicles compact the soil. Wet or soft soil can be damaged by ruts that form waterways during rains. Dry and sandy soil may have so little vegetation that plant roots and seeds may be destroyed. An alpine meadow may suffer erosion from wheel tracks, or its fragile vegetation may be crushed.

Wildlife must not be disturbed, especially during critical nesting and birth periods. Drive, watch, or photograph from a distance, so that the adult bird or animal stays with its young. Never chase animals with a vehicle.



Giving game can be a gesture of thanks, but be sure to know the regulations regarding such gifts.

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Every ATV user should be sure his spark arrester and exhaust system are in top working condition to avoid fires.

Courteous off-road vehicle users will respect the rights of other travelers to enjoy leaving civilization behind them. Pack out all cans, wrappers, and other litter to leave the scenic view as clean as you found it. Avoid bringing motor noise, radio, or generator sounds into areas where others may have gone to find quiet, primitive-style hunting, camping, or fishing.

The only safe way to carry a firearm on an ATV is unloaded and cased or unloaded on a proper gun rack. Misuse of an ATV can cause land erosion.

While most outdoor recreationists have a respect for the land, there are still those, who, for whatever reason, continue to damage the environment. Because of this abuse most of the private land, and almost half of our public land, has been either closed or restricted to vehicle access. As a responsible hunter, it is your duty to be sure all forms of backcountry travel do not abuse the environment.

Alcohol and Drugs

A safe, responsible hunter knows that *alcohol* and *drugs* affect skill, judgment, reaction time, and coordination. Alcohol and drugs act like static interfering with the communication from your eyes and ears to your brain and back to your body. The best way to avoid the dangers of alcohol or drugs is to say no to alcohol and drugs.

Alcohol in your bloodstream reaches all parts of your body. It does not warm you. Instead, it hinders your body's ability to keep warm. Control centers of your brain switch off. Eyes do not see clearly. Identification of a target and its background is affected. Your aim is unsteady. Coffee and cold showers do not sober a person; only time does.

Knowledgeable hunters will know that a positive image of hunters and hunting starts with their own self-esteem. Everyone likes to fit in with their friends and group. The peer pressure this causes can affect the way you act and feel. But real friends will respect you for knowing when to say no, even about little things. Be yourself, and you will be thought of as a capable, safe, and responsible hunter.

The harmful effects of mixing alcohol or drugs with hunting or while driving to and from hunting can lead to injury and death. Letting alcohol or drugs alter your mind is not smart and is dangerous.

Hunting is a sport best enjoyed when you are in control of yourself. The best hunting comes from safe, sober, responsible behavior.

Do not drink while hunting.

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Hunting Laws and Regulations

Types of laws

A responsible hunter will always remember that hunting in America is a privilege, not a right. As with any privilege there are certain rules or standards which you must meet or the privilege can be withdrawn. These standards are the laws and regulations pertaining to hunting and other outdoor uses. Many people think game laws were designed by legislatures or government departments to protect wildlife from hunters. Actually, the very opposite is true—hunters and other sportsmen have designed the laws and insisted these laws be passed to protect and conserve wildlife and their habitat.

Laws are made by legislatures or citizen representatives at the federal, state, and local (municipal) level.

Federal laws are often concerned with wildlife issues such as migratory birds, which move from state to state or move through the country on seasonal migrations. Other federal laws may concern threatened or endangered species in one or more locations in the country.

State laws are formulated to manage and regulate the hunting of animals that are non-migratory and reside within the state.

Municipal laws that affect hunters often pertain to firearms usage in or near cities or residential areas.

There are a lot of different laws on many topics pertaining to wildlife and habitat management. It may be helpful to break these down into four general categories:

Laws that protect wildlife and their habitat.

Example—closed and open seasons.

Laws that protect people.

Example—hunter orange requirement.

Laws that insure distribution of game or opportunity to hunt.

Example—licensing by areas.

Laws that insure fair chase (hunter behavior).

Example—shooting from motorized vehicle.

Photo courtesy NC Wildlife

Sportsmen and conservation officers work together.

Regulations

Most state legislatures have given their wildlife management agency authority to issue regulations for wildlife management. These regulations carry the weight of the law behind them, but are more easily changed to meet changing conditions. For example, the law might state that it is illegal to hunt at any time other than during a specified season, and also say what the penalties are for breaking this law. It is the Game and Fish regulation, however, that sets the actual dates of the season for that year. These seasonal dates may vary from year to year because of changes in animals' populations due to extreme weather conditions or other habitat changes.

It is your responsibility to know the laws and regulations pertaining to the type of animal and the area where you will be hunting. Ignorance of any law, whether in hunting or other aspects of life, cannot be used as a defense in the legal system.

Individual states and provinces have different sets of hunting laws and regulations. For information about a particular state, contact a regional wildlife management office or the hunter education office for that state.

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HUNTER RESPONSIBILITY—Review

1. What is meant by the term “hunter responsibility”?

2. Explain why hunting is a privilege, not a right.

3. Define the terms “fair chase” and “ethics” and tell why they are important to the hunter.

4. What are five basic responsibilities of a hunter?

5. Name the five different stages of a hunter and explain the major characteristics of each stage.

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2 Firearms and Ammunition

History and Heritage of Firearms

A *firearm* is a tool invented by man to propel a projectile (a missile which is thrust out of a firearm by force) by burning gunpowder.

Early man did not have strong enough hands and teeth to take large animals for food. But his survival depended on large amounts of food. He used tools to take even the biggest animals, including mammoths, bison, deer, and wild horses which would furnish food for many days.

Man's earliest hunting tools were clubs, rocks, and short spears. He also used pitfalls and rock slides to kill animals. Often, hunters would wait at watering places where large animals could be wounded and driven into muddy spots to slow them until the final kill. This was dangerous. Primitive hunting was usually at close range, where an animal might injure or kill the hunter.

Predators such as wolves, cave bears, and saber-toothed cats were hunters, too. This meant that man had to look two ways when hunting. He had to find and take meat without being eaten himself.

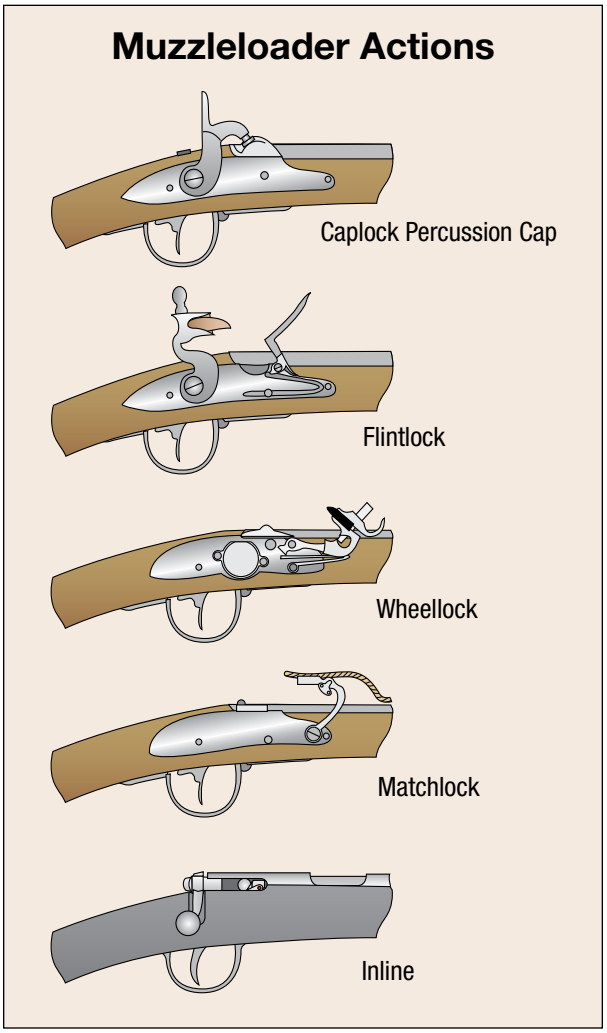
Hunting tools that used projectiles increased the safe distance between man and animal. Slings, throwing sticks for spears, and bows and arrows were among the first tools used for hunting. Skill in the use of projectiles depended on the hunter's eyesight, aim, and ability to estimate distance.

The discovery of gunpowder in about 1200 A.D. led to a new tool that could throw **projectiles** when this powder burned with explosive force inside a closed tube. History books say that the first gunpowder was used in China to make firecrackers. It was called *black powder*, a name that has been used ever since.

During the middle of the next century, hand cannons were used to project rocks, bits of metal, and other hard objects. These crude tubes were closed at one end and had a touch hole through which a burning match, wick, or hot wire could set off the black powder.

Firearms shot from the shoulder were in use in Europe at least 100 years before Columbus sailed for America.

The ammunition commonly used was lead balls, which were ideal for large animals. Smaller shot (small, round lead pellets) was used for small animals and birds. Firearms were loaded from the muzzle end. They were called *muzzleloaders*, a name which still applies to black powder firearms.



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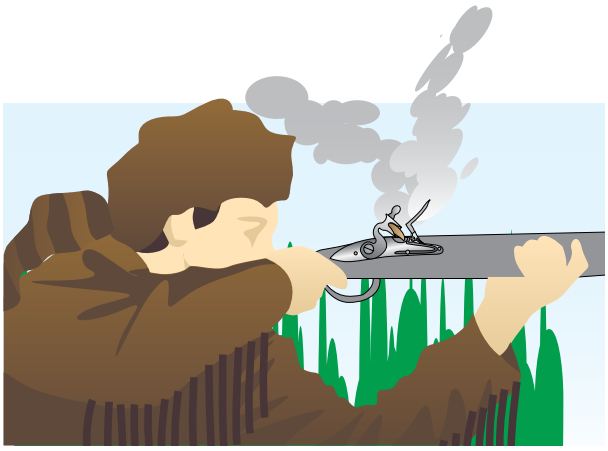

Eye and hearing protection is recommended for muzzle-loading and all other firearms.

When the first English and European settlers came to America, black powder firearms were important tools for survival. Here was a new wilderness, filled with wild animals and fowl. The animals and birds seemed to be in endless supply, and belonged to anyone who was able to take them. Pioneers depended on their firearms for both food and defense. Good hunters and marksmen were needed as much as the first crops.

North American improvements to muzzle loaders gave settlers more accurate and reliable firearms. American riflemen were the first to use a patched round ball.

When *percussion caps* were devised, they paved the way for the invention of metallic cartridges, making it possible to load firearms from the breech (rear of the barrel). This increased the number of shots that could be fired in a given time. Expansion into the western states and provinces required dependable firearms. Large game animals such as buffalo and grizzly bear were taken with the breechloading Sharps rifle, one of the most popular western firearms.

A period of intense firearm development occurred from 1850 through 1890. From before the Civil War to the time of railroad construction across the continent, firearm improvements led to repeating rifles, carbines, and the western six-shooter.

Firearms became common tools that often were known simply by their maker's name, such as Sharps, Spencer, Henry, Colt, Derringer, Remington, Whitney, and Winchester. Their history is linked to the settlement of both the United States and Canada.

The popularity of muzzleloading firearms began to decrease. Centerfire and rimfire firearms developed during the late 1800s led to today's highly accurate, rapid-fire firearms.

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Rifles—Key Terms

Action—Assembly which loads, fires, and ejects a cartridge.

Ammunition—Any powder, shot, or bullets used in rifles, pistols, and shotguns.

Bolt—Operating part of a bolt-action firearm which loads and unloads ammunition.

Bore—Inside part of the barrel of a firearm.

Breech—Rear end of a firearm barrel. Modern firearms load from the breech.

Caliber—Measurement of the rifle bore. It is the distance between the lands, usually measured in hundredths of an inch.

Cartridge—Round of ammunition which includes primer, powder, case, and the bullet or shot.

Chamber—Enlarged part of the bore into which a cartridge is placed by hand or inserted by the action.

Firing pin—Metal which strikes the primer of ammunition, starting the firing process.

Forearm—Front end of a firearm's stock.

Hammer—Part of the action which strikes the firing pin, causing the ignition of ammunition.

Lands/Grooves—Spiral ridges and depressions cut into a rifle's bore.

Lock—Firing assembly of a rifle.

Magazine—Part of a repeating firearm which holds ammunition until it is ready to be fed into the chamber.

Muzzle—End of a firearm barrel from which the bullet leaves.

Projectile—Missile which is thrust out of a firearm by force.

Stock—Wooden, composite (such as nylon or fiberglass), or metal frame that holds the barrel and action.

Trigger—Device that starts the firing process on a firearm.

Rifles

Modern Firearms Description

Safe, responsible, and knowledgeable hunters should learn how a firearm works. It is important also to know the differences between shotguns and rifles. New hunters should study the types of firearms and their major parts, as well as learn the function of each part.

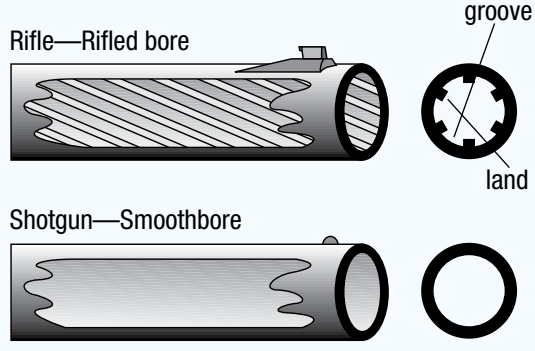
Rifles and shotguns operate in much the same way. Some look very much alike. Each has a barrel, action, and stock. The big differences are inside the barrel and action.

The metal of a rifle barrel is thicker than a shotgun barrel. Inside the rifle barrel, grooves are cut into the metal. This is called *rifling*, a term which gives the firearm its name. The metal left between grooves is called a *land*. The grooves are cut in a spiral which makes a bullet spin as it goes through the barrel. Spinning makes the bullet go straighter and farther. A rifle *cartridge* (also called a round) is made of four parts: the *case, primer, powder,* and *bullet*. The primer can be around the cartridge's inside base rim (*rimfire*), or in the center of the case head (*centerfire*).

The *bore* of a rifle is usually measured from one land to the land opposite it. The measurement determines the *caliber* of the cartridge. Caliber is given in hundredths of an inch or in millimeters. Examples are .22 caliber, .270 caliber, and 6 mm. Another way that some rifle makers measure caliber is between the grooves in the barrel. One example is the .257 Roberts.

The .22 caliber is used where it is legal to hunt rabbits and other small game. A .270 caliber rifle cartridge may be used for large game such as deer or bear. The .458 caliber would be used to shoot very large animals such as elephant or African water buffalo.

Bore Types



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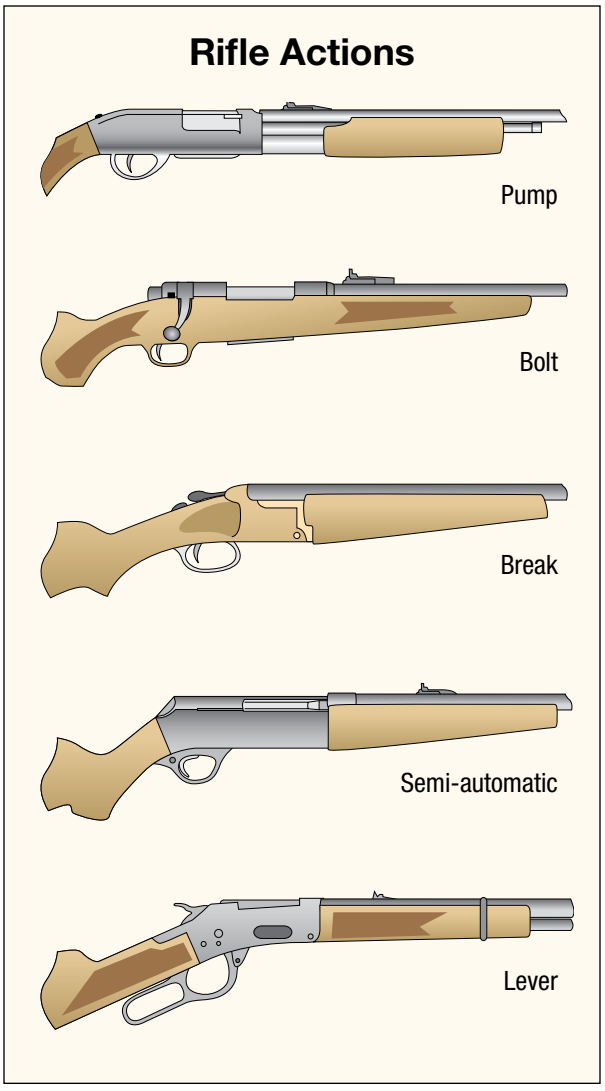

The *action* is the heart of a rifle. It is that part of the assembly that loads, fires, and ejects a cartridge. The rifle's action is built for the pressure generated by the cartridge when it is fired.

There are five types of rifle actions. The most common rifle has a *bolt* action. The others are the *lever* action, *pump* (slide) action, *semi-automatic* (autoloader), and *break* action rifles.

Single-shot rifles that hold and fire only one cartridge have the simplest action. Early single-shot rifles were "drop-blocked" or "rolling block" and lever-action, followed later by break-action and bolt-action types. One cartridge at a time was loaded at the rear (breech) of the rifle.

The beginning shooter should learn to shoot a single-shot rifle first. These rifles are not only safer but teach you to make each bullet count. A responsible hunter will aim and shoot only one bullet whenever possible.

Repeater is the name given to rifles that can carry more than one cartridge in the magazine and fire several shots before reloading. Repeater rifles include the bolt-action, lever-action, pump-action, and semi-automatic. The first three types of actions must be operated by hand between each shot. This allows the action to take out (extract and eject) an empty cartridge case and load the next cartridge.

A *semi-automatic rifle* will extract an empty cartridge, load a fresh one, and cock the rifle for the next shot. All a hunter must do is pull the trigger for each shot.

All repeater rifles have a *magazine*. This holds stored cartridges ready to be loaded into the chamber. A magazine may be of clip, box, drum, rotary, cylinder, or tube style. Its function is to properly feed one cartridge at a time for loading. Magazines may be part of the receiver or join the receiver ahead of the trigger and trigger guard.

Some semi-automatic rifles are called automatics. This is not a proper term for a firearm used in sport shooting or hunting. *Automatic firearms* continue firing as long as the trigger is held down or until all the cartridges are fired. Examples of automatic firearms would be a machine gun or the famous BAR (Browning Automatic Rifle) that was used in World War II.

Automatic firearms are not legal to use anywhere in North America.

Firearm Parts

The *barrel* of a rifle is the tube through which a bullet is fired. The end of the barrel is called the *muzzle*. The barrel usually is attached to the action by a screw thread at the receiver (breech) end. This end has a slightly larger diameter than the rest of the barrel. The inside of the breech end of a rifle barrel, the *chamber*, is an enlarged part of the bore into which a cartridge is placed by hand or inserted by the action.

The *stock* is the wooden, composite (such as nylon or fiberglass), or metal frame that holds the barrel and action. Its functions are to help put your eye quickly in line with the sights, to allow you to hold your aim steady, and to absorb recoil when a shot is fired. The part you hold against your shoulder is called the *butt*. Good stocks will have a plastic, rubber, or metal butt plate. The top ridge or crest of the stock is the *comb*. If the top part of the comb where your face touches is raised, it is called a *cheekpiece*. The smaller part of the stock behind the receiver is the *grip*. The part of the stock under the

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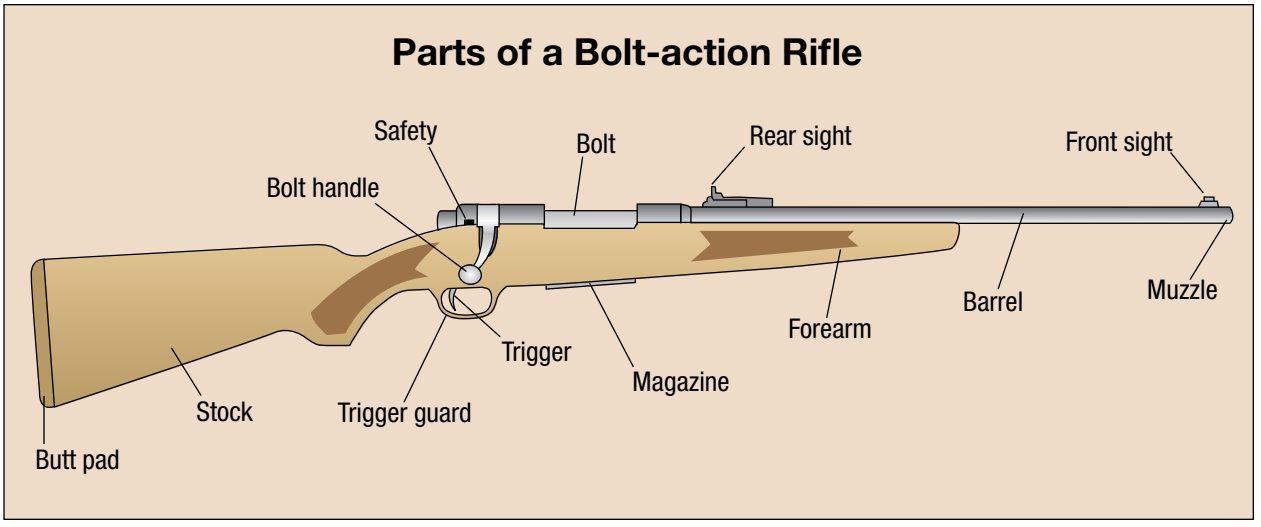

barrel is called the *forearm* (or fore-end). Both the grip and forearm may be checkered, usually in a diamond pattern, to give your hands a better hold.

There are three basic types of rifle sights: *open, peep*, and *telescope*. All are mounted on top of the barrel. You use the sights to aim each shot accurately.

Open sights come in two parts. There is a blade, bead, or post at the muzzle end of the barrel. This is the front sight. The rear sight is a plate, bar, or strip of metal on the top rear of the barrel or receiver. It will have a square, "V," or "U" notch cut in its top. Open style rear sights can be moved to change where your bullet will hit a target. If you want a bullet to hit the target more to the right, move your rear sight to the right. Sights may also be raised or lowered on a ramp to raise or lower bullet impact. Some open rear sights are called leaf sights. These have hinges and can be raised for accurate aiming.

Peep or aperture sights also come in two pieces. The front sight is a blade, bead, or post. The rear sight is round, with a small hole in the middle. Look through this peephole (it will appear fuzzy), and your eye should automatically focus the center of the peephole on the front sight and target. Sight adjustments are made in the same way as with open sights.

Telescope sights do not use a front sight. Your aiming point is inside the telescope. It is called the reticle. Most telescopic sights use a post, post and crosshair, crosshairs, or crosshairs and dot as aiming points. Telescope sights make the image of your target and the surrounding area appear closer to you. The degree of enlargement Is called power. Power is stated as 2X for two times as large as normal, 4X for four times as large, and so on. As an example, some variable telescope sights are marked as 3X-9X. This is similar to a zoom lens on a camera.

You will learn how to use these three types of sights in the section on shooting fundamentals.

The *trigger* and *trigger guard* are considered parts of the action. A rifle trigger is squeezed to start the movements of the action's parts that fire the rifle. The function of the trigger guard is to protect the trigger from accidentally being bumped or pulled by branches, clothing, other objects, or careless fingers.

Safety

Most rifles will have a *safety* which is designed to prevent the firearm from firing if the trigger is pulled accidentally. Safeties either prevent the trigger from being able to move or the firing mechanism from being able to work. Safe, responsible shooters will always know where the safety is located and how to operate it before learning to load and fire. The safety may be a button, movable pin, thumb lever, thumb hammer, or sliding plate. It is moved from "on" to "off" only when you are ready to fire a shot. The safety might not block the hammer or firing pin, however. A hard blow or dropping the rifle could still cause it to fire, even with the safety on. *Since a safety is a mechanical device, it can fail to work. Handle each rifle responsibly even though you are positive the safety is on.*

Be extra careful with lever-action rifles. Many lever-actions are cocked by the forward movement of the lever. On some lever-action rifles, cocking exposes the trigger.

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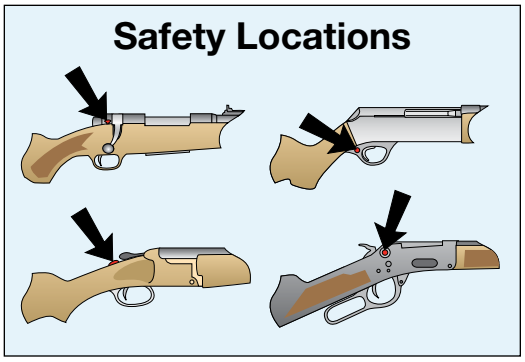
A safe hunter always controls the rifle's muzzle and keeps his fingers outside the guard and away from the trigger until ready to shoot. Models having an external hammer are put on safety by carefully lowering the hammer and then resetting it to the half cock position. It is also wise to remove gloves or mittens when operating the lever or hammer so that a slip will not fire the rifle. A stiff hammer spring might even require using both your thumbs to control it while the hammer is lowered. Young hunters may not have enough strength in their thumbs to operate a hammer safely. Parents should check this out before going hunting.

Never substitute using a safety for safe firearm handling.



Shotguns—Key Terms

Bore—Inside part of the barrel of a firearm.

Buckshot—A large size of shot.

Case—Container which holds primer, powder, and the bullet or shot.

Centerfire—Ammunition in which the primer is contained in the center of the base.

Choke—Bore construction at the muzzle which controls the spread of the shot and its pattern. Types include cylinder, improved, modified, and full.

Gauge—Shotgun measurement which is determined by the number of lead balls the exact size of the bore it would take to weigh one pound.

Pattern—Density and scattering of shot pellets when fired. Patterns are affected by choke.

Shell—Container which holds shot and other parts of ammunition for shotguns.

Shot—Balls of lead or steel used to fill a shotgun shell.

Smoothbore—Firearm without rifling in the bore, usually a shotgun.

Shotguns

Shotguns are the most versatile (having many uses) hunting firearm. By careful selection, one shotgun can be bought as an all-purpose firearm. It can be used for targets (skeet or clay pigeons) or hunting quail, pheasant, deer, and even bear. This is possible because of the many different shotshell loads and choke choices that shotgunners have.

A shotgun fires many small pellets, called *shot*, in a pattern at a target. These pellets ,may be made of lead, steel, or other materials.

The smooth bore of a shotgun is measured by *gauge*. Modern shotguns come in 10-, 12-, 16-, 20-, 28-, and .410 gauges. The .410 "gauge" really means .410 "caliber", but generally is named this way to show it is in the shotgun family. Gauge is measured by the number of pure lead balls the exact size of the bore it would take to weigh one pound. For example, a 12-gauge takes a lead ball weighing $\frac{1}{12}$ of a pound (37.8 grams).

Shotguns generally have longer barrels than rifles. This is to help shooters hold and balance the gun better. Longer barrels do not shoot farther, nor do *magnum shotshells*, which contain more powder and shot than normal shells.

Magnum loads only fire more shot, which improves your shot pattern at longer range. The additional powder is needed to push the extra shot.

Black powder shotguns need barrels up to 36 inches to get full velocity of the shot through the barrel. Velocity is how fast the shot is propelled. Depending on the load, modern shotshells achieve full velocity in 24 inch

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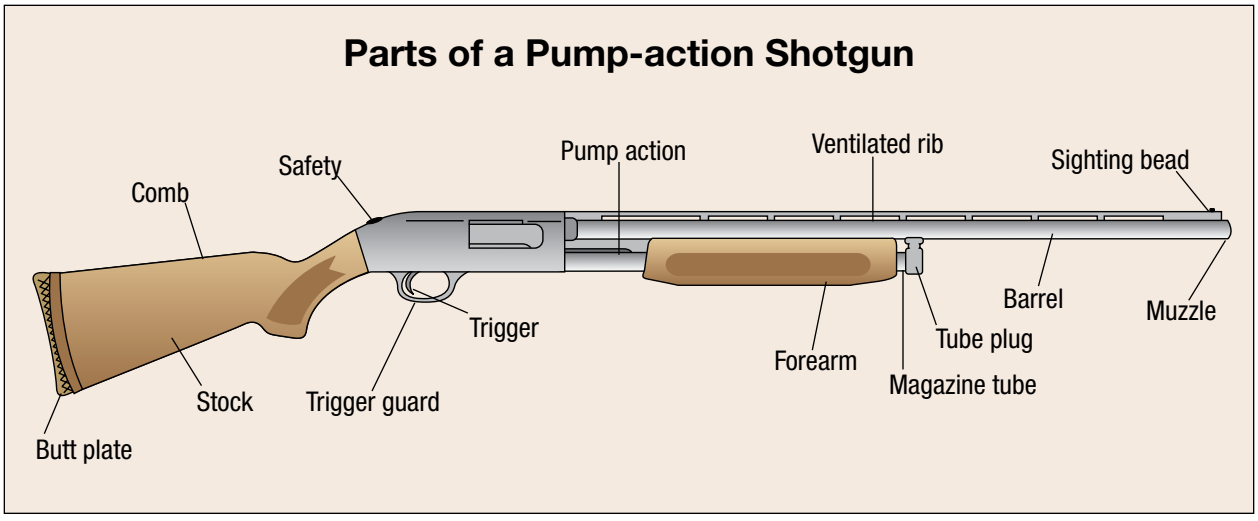


barrels or shorter. In longer barrels, the shot actually begins to slow down a little because of friction past the 26-inch (.66 meters) mark.

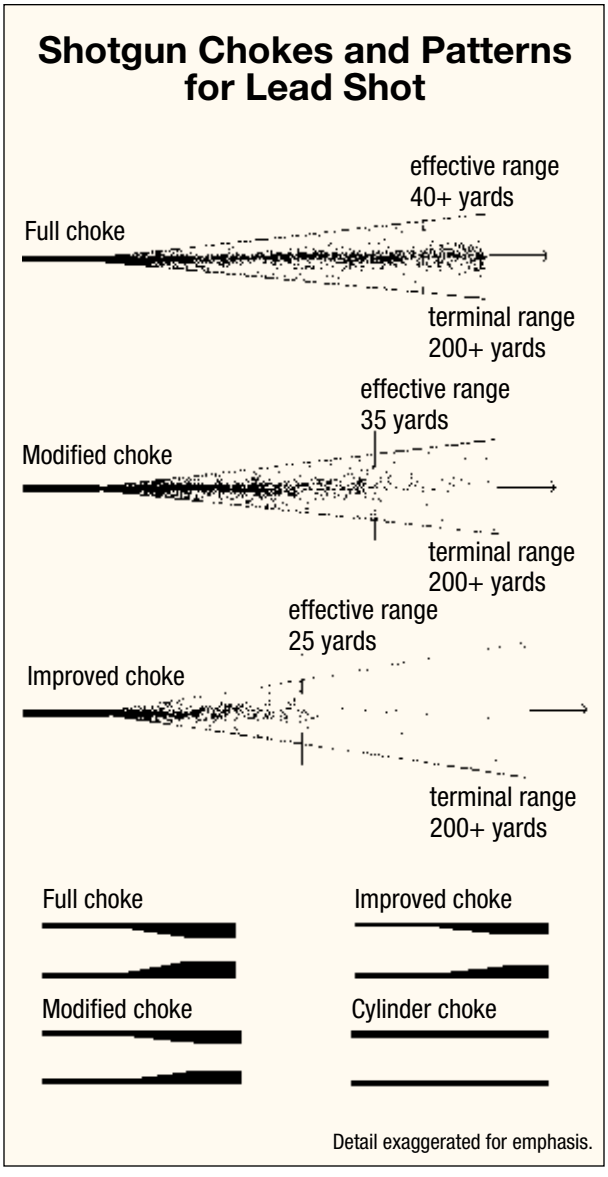
Shot pellets begin to scatter as soon as they leave the muzzle of a shotgun. The farther they travel, the farther apart they scatter. When a duck or pheasant seems to fly through a shot pattern unhurt, it may be because the pellets separated so far that none struck the bird.

The *choke* is a bore constriction at the muzzle. Choke size determines shot patterns for different types of shooting. Most shotgun barrels are made with permanent chokes, with the bore slightly smaller near the muzzle. This makes the shot squeeze together when leaving the barrel and keeps it together longer.

It is easy to understand what a choke does if you compare it to the nozzle of a water hose. Wide open, the nozzle will spray everything in front of it but won't reach out very far. Nearly closed, the nozzle will release a tight stream of water that will travel farther away from you.

There are four types of built-in chokes: *cylinder, improved, modified,* and *full*. You can also have your shotgun fitted with an adjustable choke or sleeve that will let you change from one choke to another.

A *cylinder choke* (also called *open choke*) is actually no choke at all. The bore of the shotgun barrel is the same all the way. Open or cylinder choke is used for close shooting such as for small upland game animals and birds, and for shooting skeet. Shot scatters widely as soon as it leaves the barrel. An open choke is also preferred for rifled slugs and buckshot.



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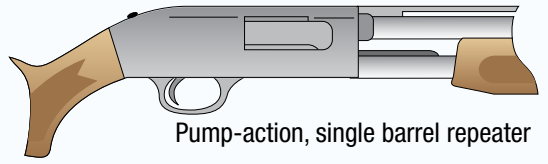
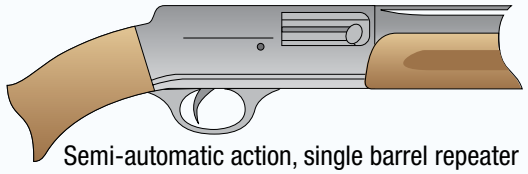
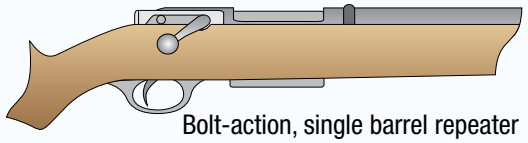
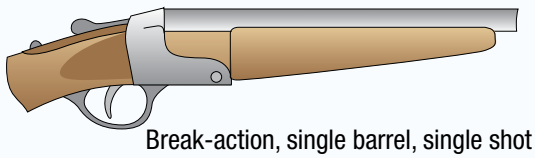
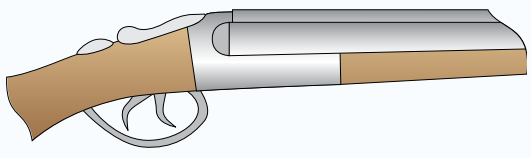
Shotgun Actions

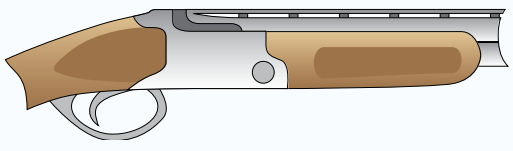

Pump-action, single barrel repeater


Semi-automatic action, single barrel repeater


Bolt-action, single barrel repeater


Break-action, single barrel, single shot


Break-action, side-by-side, double barrel


Break-action, over-and-under, double barrel

An *improved cylinder* choke is fine for hunting upland birds, small game, and for hunting ducks over decoys. The pattern it makes is tighter (closer together) than open choke.

Modified choke produces still tighter patterns. The shot pattern it makes is a good one for most upland game and duck hunting.

Full choke keeps shot pellets very close together. This is the choke used most.

Adjustable chokes are also called variable chokes. They can be changed by hand, just like your garden hose nozzle, from open spray to a tight, narrow shot pattern.

Shot size is determined by the diameter of the pellet. The smallest standard shot size is No. 9 and it takes about 585 pellets of this shot size to weigh an ounce.

Some other shot sizes are 8, 7½, 6, 5, 4, 3, 2, and 1. The smaller the number, the larger the shot size.

For many years shot has been made of lead. Newer types, made of steel (actually soft iron) or other types of compounds, are referred to as *non-toxic* shot.

Some shotguns fire better *patterns* with one shot size or brand of shotshell than they do with another. Let's see how to find which is best for your shotgun.

Prepare several 40-inch (1016 mm) square sheets of paper by drawing 30-inch (762 mm) diameter circles around their centers. Fire at these targets from 40 yards (36.58 meters) away. Next, count the number of shot holes inside the circles on each target. You know the number of pellets in each shot size. Divide the number of shots in the circles by the total in each shot size to get the percentage. The shot size or brand that gives the highest percentage is best for your firearm.

All states require that non-toxic shot be used in certain areas to prevent waterfowl poisoning and contamination of the habitat. You should pattern your shotgun again if you shoot non-toxic shot since it may pattern differently. Try out different chokes and shot sizes to get better patterns.

Patterning a shotgun may also tell you that the shotgun doesn't fit you properly (see the section on shooting fundamentals), or that there are holes in certain size shot patterns. Try different loads (powder and shot weights) and brands of shotshells to find what is best for your shotgun.

Shotguns are available in several types of action. You will find *break* (hinge) action, *pump* (slide), *semi-automatic*, and *bolt*-action shotguns.

Break-action shotguns open at the breech so you can load shells by hand. Some are single-shot and others have two barrels. *Double barrels* can be side-by-side or over-and-under. Double-barrel shotguns usually have different chokes in each barrel. One barrel is choked for close shooting and the second barrel for longer distance. Some doubles have triggers that let you choose which barrel to fire. Others fire the close range barrel first and distance barrel last.

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Bolt-action shotguns feed a shotshell into the chamber each time the bolt is operated. After a shot, the empty shell is ejected before the next shell is loaded.

Pump-action shotguns work much the same. The shooter pumps the forearm between shots to eject and load shells.

Semi-automatic action shotguns will eject and load for you between shots, without further hand operation.

Single-shot, double, and bolt shotguns are good choices for hunting when you expect to get only one or two shots at game.

Pump and semi-automatic actions may be the best for sports like waterfowl hunting. Several shots can be fired quickly at the same or different targets.

Shotshells may be stored in a tube, box, or clip magazine. Double barrel shotguns may have single or double triggers (doubles) to select the barrel you wish to fire. A shotgun's safety may be a latch, sliding lever, or pin. If a shotgun has a hammer safety, it may be difficult for young shooters to cock or lower it against a stiff spring. It is important to point the shotgun in a safe direction while moving the hammer. Gloves or mittens should be removed so the hammer will have less chance to slip.

Wyoming and some other states require a plug in autoloader or pump shotguns that limits the number of shells you can load. You are responsible for knowing these regulations.

Using a Shotgun as a Rifle

In many states, shotguns can be used like rifles for some game animals. Your local regulations may require that only shotguns be used in certain areas or only during specified seasons.

When used for big game, shotguns fire either rifled slugs or buckshot. These loads do not harm the shotgun barrel and are usually accurate to about 75 yards (68.58 meters).

It may be necessary to add rifle-style sights to your shotgun barrel for more accurate aiming and shooting. If needed, you should follow the rifle steps on sighting-in and aiming, as given in the shooting fundamentals section.

Handguns—Key Terms

Cylinder—Part of a revolver in which cartridges are loaded or placed.

Frame—The metal housing that gives handguns their shape.

Grip—To grasp firmly; a firm hold on something. Also, the stock of a handgun.

Half cock—Certain point between having the firearm hammer in a firing position and in a down position.

Handgun—Firearm having a short barrel and which is usually held at arm's length, rather than at the shoulder, to fire.

Magazine—Part of a repeating firearm which holds ammunition until it is ready to be fed into the chamber.

Pistol—A handgun that does not have a revolving cylinder.

Revolver—Firearm having a revolving cylinder for placing the cartridges.

Introduction to Handguns

A handgun has a short barrel and is held at arm's length, rather than against the shoulder, to fire.

Handguns have been made in many sizes, from tiny .22 pocket guns to .70 caliber "horse pistols" used in the Civil War.

Handguns are often called *pistols*. This name may have come from the town of Pistola, Italy, where many handguns were made in the 15th and 16th centuries. Pistol is the correct name for handguns that do not have rotating cylinders as part of their action.

Basic Handgun Parts

Each type of hand firearm has three major parts: *frame, barrel,* and *action*. Revolvers and semi-automatic pistols have a fourth major part. This part is called a *cylinder* in revolvers, and a *magazine* in semi-automatics. Its function is storage of cartridges.

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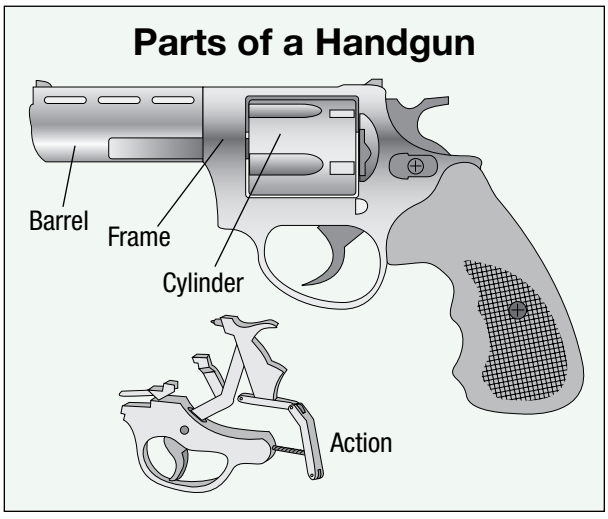


The frame is the metal housing that gives handguns their shape. Other parts are connected to it. The barrel is the hollow tube through which a bullet is fired. Most modern handgun barrels are shorter than 12 inches. The tip of the barrel is the muzzle. All modern handguns have *rifling* inside the barrel—spiral grooves which cause a bullet to spin when fired.

The *action* fires the cartridge. Basic action parts are trigger, mainspring, and hammer. Cocking the hammer on a handgun compresses the mainspring. Squeezing the trigger releases the hammer to strike a firing pin against the rim or primer area of a centerfire cartridge.

Your hand holds the turned-down rear part of the frame, which is called the butt. Grip panels are located on each side of a handgun's butt. These may be made of wood, hard rubber, metal, bone, ivory, or synthetic materials. A forearm is sometimes used on target handguns for match shooting.

Handgun sights look much like the open sights on a rifle. The front sight is a blade or post, often set on a ramp. The rear sight is generally a square or "V" notch cut in a solid bar or plate of metal. This sight may be rigidly set by the maker, or you may be able to adjust it for windage and elevation.

Actions

Modern handguns have four kinds of actions—*single-shot, revolver* (single- and double-action), *semi-automatic,* and *bolt*.

Single-shot pistols are generally break-open guns. But they may be bolt-action firearms that are operated like rifles and shotguns. Each single-shot is loaded by hand, and the spent case is ejected by breaking the action open or pulling the bolt back. The pistol is loaded only when actually ready to be fired. Some pistols have a "half-cock" position to lock the hammer. However, worn parts (especially the sear or firing pin) can make use of this procedure unreliable.

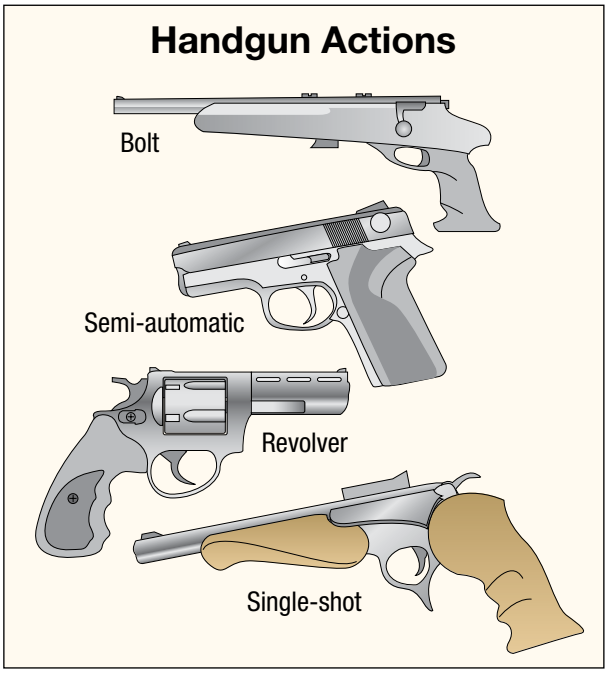
Revolvers have rotating cylinders that hold cartridges ready to fire. The cylinder has two functions. It is both a magazine and chamber. As the magazine, it stores cartridges ready for firing. Rotating the cylinder brings each cartridge into alignment with the barrel. When the trigger is pulled and the hammer falls, the cylinder becomes the firing chamber.

Two kinds of revolver actions are used today. Modern revolvers are either a single-action or a double-action. The hammer of single-action revolvers must be cocked by hand before they can be fired. When the hammer is cocked—generally with the thumb of the non-shooting hand—the cylinder revolves. You must cock the hammer again for the next cartridge to rotate into firing position.

Double-action revolvers have a faster rate of fire. Squeezing the trigger will cock the hammer, rotate the cylinder, and let the hammer drop. With a double-action revolver, you can also cock and fire each shot, operating it like a single-action revolver.

Loading Revolvers

Revolvers are loaded in one of three ways. Most single-action revolvers are loaded through a *gate on the right*



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side of the frame. The cylinder is not opened or removed. To load, point the muzzle in a safe direction. Then draw the hammer back to half-cock (this is also called loading cock). Turn the cylinder by hand and fill all but one chamber. Safe hunters will turn the empty chamber so that it is under the hammer. Then, if the revolver is dropped or bumped, it should not fire.

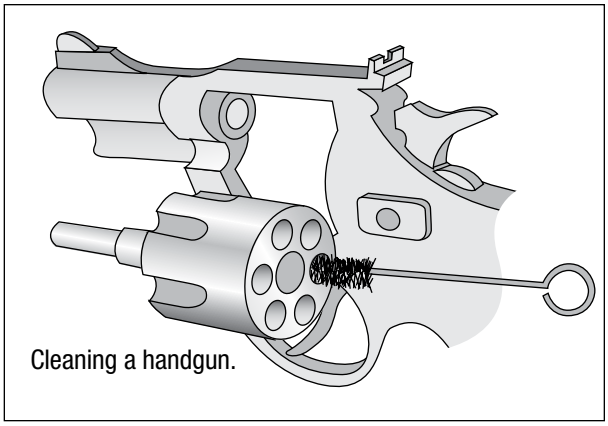
The other two types of revolvers are usually double-action and either break open (at the top rear of the frame) or feature a swing-out cylinder (to the side). In each case, there is a latch or catch that frees the cylinder so it may be loaded.

In order to reload a revolver, you must extract the fired cartridge cases. Modern double-action revolvers have a spring-loaded ejector rod, which doubles as the cylinder pin, connected to the extractor. This rod/pin is held out of the way, under the barrel, while the firearm is being fired, and it is the pin around which the cylinder revolves. Shooters can safely unload fired cases with one hand, while keeping the muzzle pointed in a safe direction.

There is no safety on a revolver. But until you cock the hammer, keeping the hammer on an empty chamber will keep the handgun from firing. The only safe way to carry a revolver is with a single empty chamber under the hammer. In the field, the handgun should be carried in a *holster* with a safety strap.

Semi-automatic pistols are the third type of handgun action. These operate very much like rifles and shotguns. Most are loaded with a detachable magazine. Cartridges are pressed into the magazine (often called the clip) and the clip is pushed up into the bottom of the pistol's grip frame.

Some semi-automatics have an external (outside) hammer that must be cocked for the first shot. Others with internal (inside) hammers are cocked by pulling the top of the pistol to the rear. This also loads the first round into the chamber. This moving part is called the slide. Increasing numbers of semi-automatics feature double-action firing mechanisms, allowing the first shot to be fired by squeezing the trigger, provided there is a live round already in the chamber and the hammer has been lowered. After the first shot, the double-action pistol will eject the spent cartridge, chamber a fresh round, and cock the hammer for the next shot.


Cleaning a handgun.

Semi-automatic pistols usually have a safety that can be operated by the shooter's thumb or finger. Responsible hunters will keep this safety on until they are ready to fire the pistol. A few semi-automatics have a grip safety that allows you to fire only when you squeeze the trigger and the grip safety.

Cleaning, Storage, and Transportation

When cleaning your handgun, it must be unloaded with the muzzle pointed in a safe direction. Ammunition should never be kept in or near the cleaning area.

Modern ammunition makes it easy to care for your handgun properly. If you keep it clean and lightly oiled, a firearm will be safe to use, stay accurate, and last a long time.

Follow the steps given in your firearm maker's manual and in a good cleaning kit. Care should be taken not to get too much oil or grease in the action or chamber. Excessive oil or grease can cause dangerously high pressures during firing.

Safe, responsible shooters will store a clean, oiled, unloaded handgun in a locked place. Ammunition should be locked away in a different place, to prevent the chance of any accident. Wipe grit or dust off loose ammunition. This will keep it from scratching the handgun's chamber and will ensure more efficient operation.

You must know the regulations about transporting firearms in a vehicle. Some states require them to be in a locked case in the trunk. Others allow them to be carried on your person with the proper permit.

There are federal state, and local laws that cover who may own, carry, or use handguns. Be sure you know and follow all regulations. This information can be obtained from local law enforcement agencies.

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Handguns are commonly used for competitive shooting sports, recreational "plinking" or metal silhouette shooting, and where permitted, for hunting.

Handgun target shooting and hunting is further discussed in the section on shooting fundamentals.

Storing a handgun.

Ammunition—Key Terms

Ammunition—Any powder, shot, or bullets used in rifles, pistols, and shotguns.

Ballistics—Modern science dealing with the motion and impact of projectiles, especially those discharged from firearms.

Case—Container which holds primer, powder, and the bullet or shot.

Centerfire—Ammunition in which the primer is contained in the center of the base.

Primer—Explosive material used to ignite the powder when struck by the firing pin.

Projectile—Missile which is thrust out of a firearm by force.

Rimfire—Ammunition with the primer mixture around the inside bottom rim of the case.

Shell—Container which holds shot and other parts of ammunition for shotguns.

Smokeless powder—Burnable material used in modern firearm ammunition. It burns quickly and develops more pressure than black powder.

Ammunition

Ammunition for firearms uses a variety of ignition systems. *Ignition* means setting fire to the propellant or powder charge.

Today's modern sporting ammunition has come a long way from the use of rocks and metal bits blown out of a tube by setting fire to black powder.

Settlers of North America needed two types of black powder, one for the primer and one for the charge itself. Sparks from the flint and frizzen ignited the priming powder which then ignited the main charge. Ball and conical bullet projectiles were used in rifled barrels which increased accuracy. The use of *patches* increased the speed of the loading procedure.

Percussion cap firearms made it possible to take some giant steps in ammunition manufacture. A small cap, ignited when hit by a hammer, exploded flame through a nipple into the powder charge, setting it off. This was the last firearm to load through the muzzle.

A French engineer named Vielle developed *smokeless powder* in 1884. It really is neither smokeless nor a powder. It is composed of more stable chemicals and is safer to use, store, and handle than black powder. Smokeless powder comes in flakes, pellets, strips, and other shapes. It allows ammunition makers to measure more closely how much powder is placed into a cartridge. This makes it possible for each *cartridge* or shotshell from the same box to shoot almost the same.

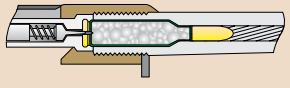
With the primer, powder, and bullet all present in a single case, rifle, handgun, and shotgun ammunition became more standardized and easier to manufacture. Better firearms could also be built. They were faster to load and more reliable. Cartridges made possible today's rapid-firing, efficient firearms.

Modern ammunition uses one of two primer styles: *centerfire* and *rimfire*. Large caliber rifles and all shotguns use centerfire ammunition, meaning the primer is located in the center of the cartridge base.

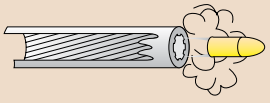
How a Firearm Fires

1. Cartridge in chamber.

2. Firing pin strikes and primer explodes, igniting powder.



3. Burning powder and gas expands, pushing bullet out.



4. Bullet and escaping gases speed from muzzle, causing noise.

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Rimfire ammunition has a primer mixture around the inside bottom rim of the case. A charge of smokeless powder propels a shaped bullet out of a brass case. The powder is ignited by a firing pin striking the rim. Rimfire ammunition is commonly used only in small caliber firearms such as the .22 caliber.

Both rimfire and centerfire cartridges are fired in the same way. Your trigger releases the hammer that drives a firing pin into the primer area. The primer explodes, setting fire to the powder, which burns very quickly. This causes very high gas pressure, which pushes the bullet or shot out of the firearm's barrel.

Ammunition Safety

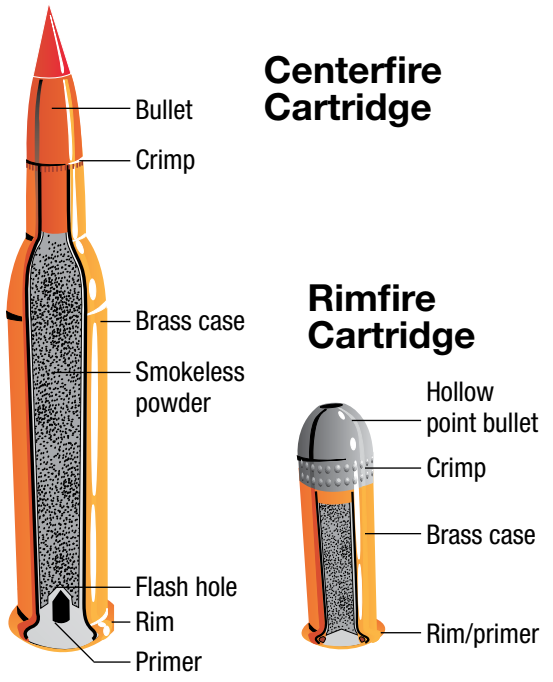
Smokeless powder develops more pressure than black powder. This made possible the development of long-range big game and military rifles, as well as modern shotguns. It should not be used in black powder firearms. Responsible, safe shooters will only use the correct powder or ammunition to avoid damage to firearms, or injuries to themselves or others.

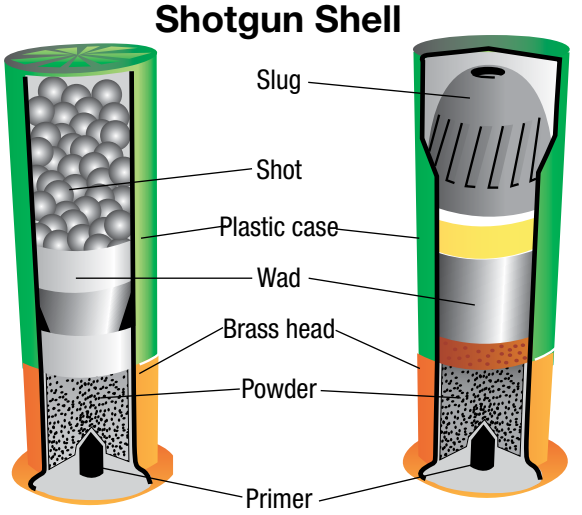
You must use only the ammunition designed for your firearm. A special safety concern involves the firearm barrel made by a process called *Damascus twist*. It was made from rolled or drawn steel strips, or rods, welded together around an iron bar, and machined to the final barrel size and length. Damascus twist firearms are very unsafe. They should never be fired with smokeless powder, and most firearm experts advise against shooting them even with small black powder charges.

Using incorrect ammunition can cause a firearm accident. Loading a second shotshell when there is already a smaller shell in the firearm can cause an explosion when the shotgun is fired. This error can be avoided by not carrying more than one size ammunition.

Safe, responsible shooters make certain they have the proper ammunition for their firearm. Caliber or gauge is stamped on the barrel of every modern firearm. Also, caliber or gauge is stamped on the base of each cartridge or shotshell and marked on every factory box of ammunition. Be sure that the ammunition you use fits your firearm.

The chamber in a shotgun is manufactured for a specific length of shell. This shell length (e.g. 2 + inch or 3 inch) will be stamped on the side of the barrel. Use only the length that is specified for that firearm. Careful hunters also will not fire magnum shotshells (more powder and shot) in a shotgun built only for standard loads. This is a dangerous practice.





The shot size is marked on shotshell boxes. You would not hunt quail with No. 2 shot, or geese with No. 9 shot. Be sure to buy and hunt with shot properly sized for your shotgun and the game you plan to hunt. In areas where nontoxic shot must be used for waterfowl, responsible hunters will only take nontoxic shotshells with them. In some cases, even having lead shot with you means you might be in violation of the regulations.

The various types of nontoxic shot will often behave differently when you fire them. For instance, you often need to use steel shot about two sizes larger than lead shot to achieve similar results. It's a good idea to pattern your shotgun to see how this affects you and your

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Popular use chart

Description	Bullet Wt. in Grains	Huntable Species (see below for number code)													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
222 Rem.	50										•	•	•	•	•
22-250 Rem.	55										•	•	•	•	•
243 Win.	75										•	•	•	•	•
	100	•	•	•									•	•	•
25-06 Rem.	120	•	•	•	•	•	•						•	•	•
270 Win.	130	•	•	•	•	•	•						•	•	•
	160	•	•		•	•	•	•	•						
7x57 mm Mauser. Rifles designated 7x57	139	•	•	•	•	•							•	•	•
	160	•	•		•	•	•	•	•						
7mm Rem. Mag.	175	•	•		•	•	•	•	•						
30-30 Win.	150	•	•										•	•	•
	170	•	•												
30-06 Springfield	150	•	•	•	•	•							•	•	•
	180	•	•		•	•	•	•	•						
	220	•	•	•	•	•	•	•	•						
300 Win. Magnum	180				•	•	•	•	•						
300 Savage	150	•	•	•	•	•							•	•	•
	180	•	•		•	•	•	•							
308 Win.	150	•	•	•	•	•							•	•	•
	180	•	•	•	•	•	•	•	•						
32 Win. Special	170	•	•												

1. Deer; 2. Black bear; 3. Antelope; 4. Bighorn sheep; 5. Mountain goat; 6. Caribou; 7. Moose; 8. Elk; 9. Grizzly bear; 10. Crow; 11. Coyote; 12. Fox; 13. Coyote; 14. Wolf.

How Ammunition Works

1. Your trigger releases the hammer.
2. The hammer drives a firing pin into the primer area.
3. The primer explodes; this sets fire to the powder.
4. This fire causes very high gas pressure.
5. The gas pressure pushes the bullet or shot out of the firearm barrel.

firearm, and then practice with the type of shot you plan to use when hunting.

Reloading

Reloading shotshells and rifle or pistol cartridges is economical. Responsible shooters will carefully follow information on reloading procedures, use correct loads, properly measure charges, and safely handle and store ammunition and reloading components.

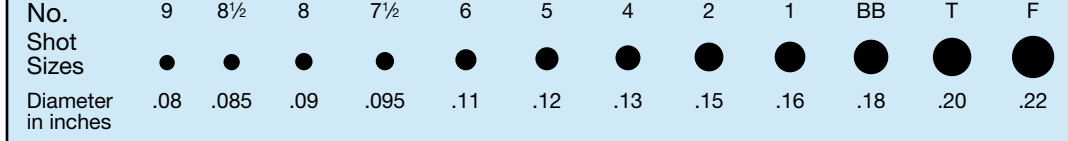
Powder supplies must be kept away from fire, cigarettes, and sparks, in a dry, cool, locked area. Check local regulations on how much powder you may have at one time.

Ballistics and Range

Every shooter should study and understand **ballistics** tables for his firearm and the ammunition used. In order to hunt or shoot safely, you must know how far your firearm and ammunition will shoot. Responsible hunters will shoot only at game within effective range.

It is also your obligation to know your target and know what is behind it. Modern shotguns will fire shot much more than the distance of a football field. Hunting rifles can shoot bullets more than three miles! If there is any reason your shot may be unsafe, do not take it. Identify your target and what is beyond it.

Shot sizes



Lead pellets per ounce (approx.)				Steel pellets per ounce (approx.)	
Size	Pellets	Size	Pellets	Size	Pellets
BB	50	6	225	BB	72
2	87	7½	350	1	103
4	135	8	410	2	125
5	170	9	585	4	192
				6	315

Check state or provincial regulations to determine legal ammunition usage.

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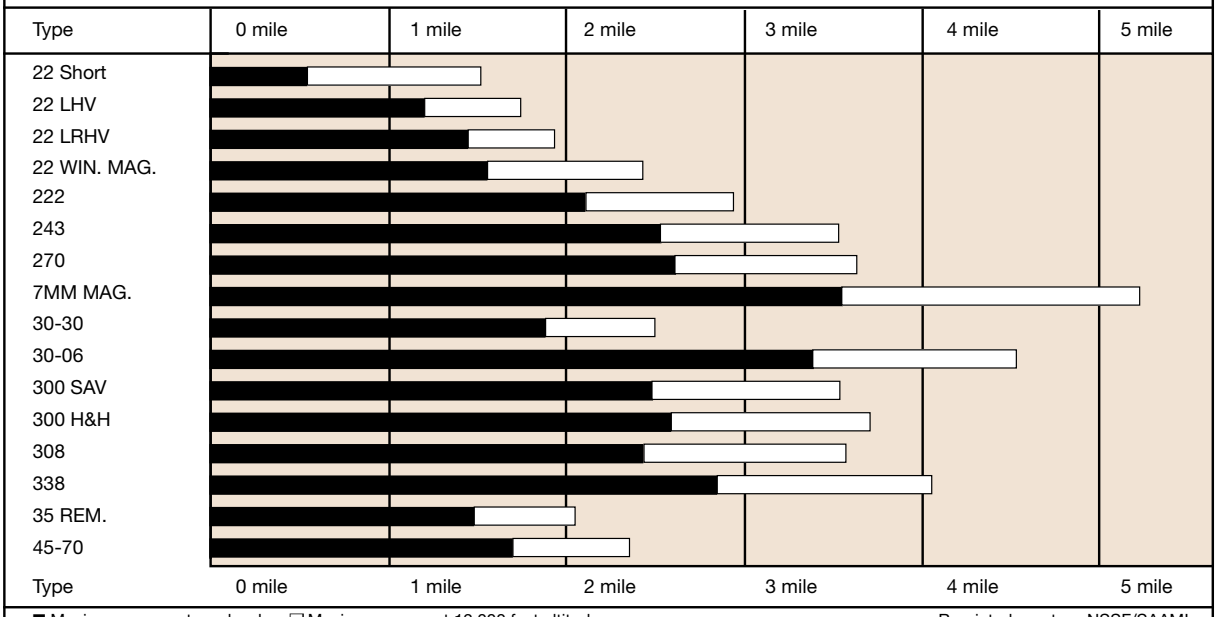
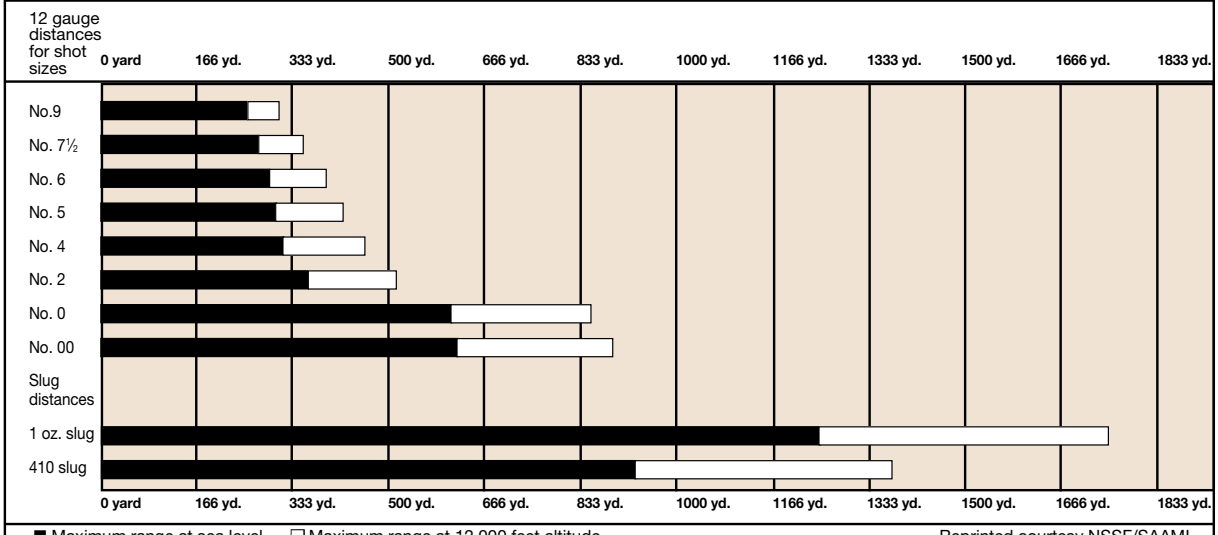
How far does that bullet travel?

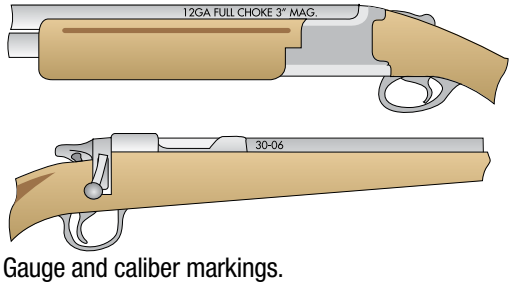


■ Maximum range at sea level. ☐ Maximum range at 12,000 feet altitude. Reprinted courtesy NSSF/SAAMI.

How far can shotgun pellets travel?



■ Maximum range at sea level. ☐ Maximum range at 12,000 feet altitude. Reprinted courtesy NSSF/SAAMI.



Gauge and caliber markings.

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FIREARMS AND AMMUNITION—Review

1. Name the three basic parts of a rifle or shotgun.

_____ _____ _____

2. What are the four parts of a rifle cartridge?

_____ _____

_____ _____

3. Name five types of actions found in rifles and shotguns.

_____ _____ _____

_____ _____

4. What is the purpose of a safety on a firearm?

_____

_____

5. Name the three major components of a handgun.

_____ _____ _____

6. What is the fourth major part found in revolvers and semi-automatic pistols?

_____

7. Compare the sights on a rifle, a shotgun and a handgun.

_____

_____

_____

8. How far can a rifle bullet and a shotgun slug travel, and why is this important to know?

_____

_____

_____

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3 Firearms Safety

Firearms Safety—Key Terms

Cable lock—Device inserted through the action that prevents a firearm from working.

Carrying position—Safe ways in which to carry a firearm. Positions include double-hand (ready carry), cradle carry, elbow carry, shoulder carry, and sling carry.

Hunter orange—Bright orange color which, when worn by hunters, has helped to decrease the number of hunting accidents.

Hunting accident/incident—Any unplanned, uncontrolled action that occurs while using a firearm or bow. This includes 'near misses'.

Muzzle control—Keeping a firearm pointed in a safe direction.

Safety—Mechanism which prevents the trigger or firing pin from operating.

Trigger Guard—Part of a firearm that protects the trigger from accidentally being released.

Zone of fire—Direction in which each hunter in a group will fire, to be agreed upon before beginning a hunt.

Firearms Safety and Handling

Safe, responsible, and knowledgeable firearms handling is the most important thing shooters and hunters must learn. National statistics show that irresponsible firearm handling causes nearly all the accidents occurring in this sport. In turkey hunting, "victim mistaken for game" is the largest accident cause. Safe firearms handling will eliminate almost all firearm accidents.

You are the most important factor in reducing firearms accidents. You can make a difference. Since Hunter Education was introduced by states and provinces, the firearms accident rate has been reduced throughout North America. Hunter Education has reduced and will further decrease the number of firearms accidents.

The key to hunting or shooting safety is to always handle your firearm in a proper, responsible manner. To do this means you will:

1. **Treat each firearm as if it is loaded.** Never accept a firearm from anyone else until you have checked personally to see that it is unloaded. For added safety, leave the action of a firearm open when it changes hands. "I didn't know it was loaded" is never an excuse.
2. **Always control the muzzle of your firearm,** pointing it in a safe direction. Keep your finger off the trigger until you are ready to fire. Keep the action open when not actually hunting. Handle your firearm safely. Insist that all members of your hunting or shooting group handle their firearms safely. Real friends do not take chances with each other's lives.
3. **Be sure of your target, and what is beyond it.** A safe hunter never shoots at a flash of color, a sound, or a shape in a bush or tree. Responsible shooters fire only at what they want to hit. In many cases you must first identify the sex of the game before deciding to shoot.

All responsible hunters are certain what is in the background, to insure that people, buildings, livestock, vehicles or equipment cannot be hit.

There are no experts in firearms safety, just responsible firearm users who gain experience by following safe handling procedures. Human error is the cause of almost all accidents. Knowing this, we should always think about why, and not just how, accidents happen.

Major Causes of Accidents

Relative to other recreational activities, hunting does not have as many accidents. Those casualties which do occur can be listed under three major causes of hunting accidents: *safety violations* (especially a loaded firearm in a vehicle); *hunter judgment* (improper identification of the target or what is in the background); and *lack of skill or aptitude* (falls, loading and unloading, and catching the trigger on an object).

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Major Causes of Accidents

The three major causes of hunting accidents are listed below. Types of situations which fall into these groups are shown, too. How could they have been prevented? One answer is given. Can you fill in the rest?

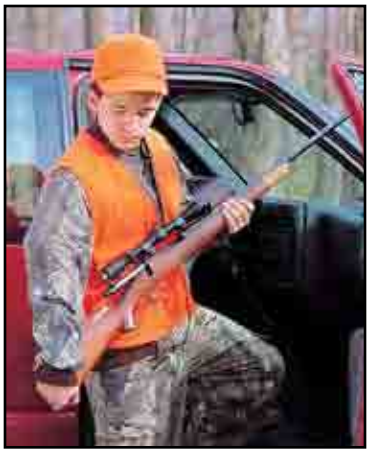
Cause	Situation	How to Avoid
Hunter's Judgment	Mistaken for game.	Be sure of your target before you pull the trigger.
Safety or law violation	Discharge of firearm in vehicle.	
Lack of skill or aptitude	Shooter stumbled and fell.	

More accidents happen in the home, at work, in cars or airplanes, on motorcycles, or when playing baseball, football, or tennis than while hunting.

Statistics from the U.S. Department of Health and Human Services show that deaths from hunting accidents rank among the lowest causes for all accidental deaths.

Muzzle control is important.

The National Safety Council report and International Hunter Education Association accident statistics all show hunting to be safer than many other well-known sporting activities. Accident rates have been reduced over 50 percent since Hunter Education has been required in almost all states. Responsible people should complete such a course even if not required.



Don't carry a closed action firearm in a vehicle

Here are some examples of self-inflicted accident causes: removing or replacing a firearm in a vehicle, a firearm falling from where it was leaned, discharging a firearm in a vehicle, improper crossing of an obstacle with a firearm, and horseplay. All of these accidents occur when safety rules or laws are violated. If responsible hunters follow safety rules and regulations, these types of accidents can be avoided.

Two-person hunting accidents occur in the following types of situations: when the second hunter is out of sight of the shooter, when the second hunter is covered by a shooter swinging on game, or when a hunter is mistaken for a game animal. If you identify your target and what is beyond it, and always know where other hunters are, this type of accident will not happen.

A large percentage of these accidents involve members of the same hunting party, usually family members or friends. Always know where your companions are. Wear hunter orange. This highly visible, colored fabric is one of the reasons accidents have been reduced by over 50 percent.

Accident Prevention

Responsible firearm handling is the key to stopping accidents. No one can halt a speeding bullet; nor can an injury be healed by wishing it hadn't happened. Do not let it happen. Plan your hunt and hunt your plan. Set up safe shooting zones and stick to them.

Many states and provinces have regulations against carrying loaded firearms in vehicles. Be sure you know your area regulations. In some places, a firearm must be

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Ten Commandments of Shooting Safety

Prevention is the solution to hunting casualties. Every hunting accident that has occurred could have been prevented. Most hunting accidents happen as a result of people ignoring firearms safety rules. Prevention involves knowing and obeying those basic safety rules.

Responsible, knowledgeable and safe hunters will learn, remember and follow these simple rules:

1. Treat every firearm with the same respect due a loaded firearm.
2. Control the direction of your firearm's muzzle. Carry your firearm safely, keeping the safety on until ready to shoot. Keep your finger off the trigger until ready to shoot.
3. Identify your target and what is beyond it. Know the identifying features of the game you hunt.
4. Be sure the barrel and action are clear of obstructions and that you have only ammunition of the proper size for the firearm you are carrying.
5. Unload firearms when not in use. Leave the actions open. Firearms should be carried unloaded and in cases to and from shooting areas.
6. Never point a firearm at anything you do not want to shoot. Avoid all horseplay with a firearm.
7. Never climb a fence or tree, or jump a ditch or log, with a loaded firearm. Never pull a firearm toward you by the muzzle.
8. Never shoot a bullet at a flat, hard surface or water. During target practice, be sure your backstop is adequate.
9. Store firearms and ammunition separately beyond the reach of children and careless adults.
10. Never use alcoholic beverages or other mood-altering drugs before or while shooting.

unloaded, broken open, cased, or locked in a vehicle's trunk. What are the rules where you plan to hunt?

Carrying Firearms Safely

There are many safe ways to carry a firearm while hunting. They are shown in the following photographs. Each method of carry keeps the firearm ready for use.

Carrying positions are designed so that firearms do not point at other hunters.

Best control of the muzzle is given by the *double-hand* or *ready carry*. Grasp the firearm's grip in one hand and the forearm in the other.

The *cradle carry* is a good one and does not make your arms tired. Cradle the barrel or forearm in the bend of one arm. Hold the small of the stock (grip) with the other hand.

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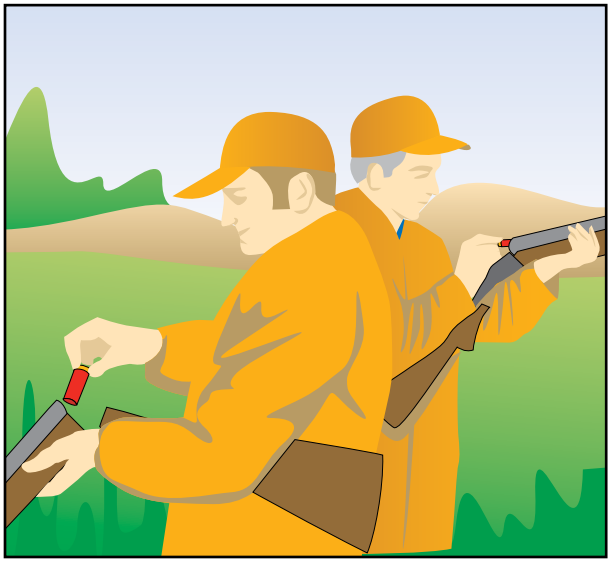
An *elbow carry* can be used when there is no one in front of you. Hook the firearm over your elbow. Point the muzzle at the ground. Of all the carrying positions, this one provides the least muzzle control, especially if the hunter trips and falls.

A *shoulder carry* works very well in waist-high brush or in corn fields. Hold the firearm at the grip and lean it on your shoulder. The muzzle should point up. This carry should not be used if there is someone behind you.

The *sling carry* is a comfortable one for long hunts and open country. Hang the firearm from one shoulder by a sling. Point the muzzle in the air. It helps to control the firearm by gripping the sling at your shoulder with your hand on the carrying side. Take the firearm from your shoulder when crossing any obstacle.



Point a firearm in a safe direction when loading.

Hold your firearm along one side of your body if you use the *trail carry.* Grip the stock with one hand. Do not use this carry when walking behind other persons.

Carrying a firearm safely is more than how you hold it. Responsible hunters will be sure that the firearm's muzzle is pointed in a safe direction and that the safety is on. Your finger must be outside the trigger guard. Do not load the firearm until you are actually hunting. Use binoculars, not your telescope sight, to identify an object.

Earlier we identified a firearm as a tool. Would you begin to use any complicated tool without reading the instructions on how to work it? The basic things each hunter must know are how to operate the safety, how to safely load and unload their firearm, and what it will do when fired.

These are some of the safe hunting skills used every day you hunt. Practice reaching for the safety until you can find it from habit. Be sure you can tell by feeling its position whether it is on or off. Then look at it to be sure.

You will load and unload a firearm many more times than you will have chances to fire it at game. Practice the steps of each procedure until they become part of your safety awareness habits.

It helps to do this using dummy ammunition. Firing ranges and clubs can assist you with this practice. Dummy ammunition should only be used under supervised range instruction. Dummy cartridges should not have a primer and you must be sure not to practice loading with live ammunition.

Safe steps for loading a firearm are:

1. Control the muzzle, pointing it in a safe direction. Be aware of the location of all other persons in your area.
2. Open the action and check it for proper operation. Leave the action open. Check the barrel for obstructions.
3. Load the magazine. This may be clip, tube, rotary, or other style. Count your cartridges or shells.
4. Close the action, loading the chamber.
5. Put the safety on. Double check it.
6. Safely carry any firearm you are using.

It is also very important to use safe unloading procedures. Some firearms can be unloaded only when the safety is off. Keep your finger outside the trigger guard and:

1. Control the muzzle, pointing it in a safe direction. Be aware of the location of all persons in your area.
2. Open the action to unload the chamber.
3. Remove the magazine.
4. Eject cartridges only if it is impossible to remove them any other way than working the action. If you must work the action to unload, do not let it completely close. Then the trigger mechanism will not engage. Use extra care with lever-action firearms.
5. Count your cartridges. Be sure the magazine is empty.
6. Look in both the chamber and magazine. A responsible hunter is sure when his firearm is empty.

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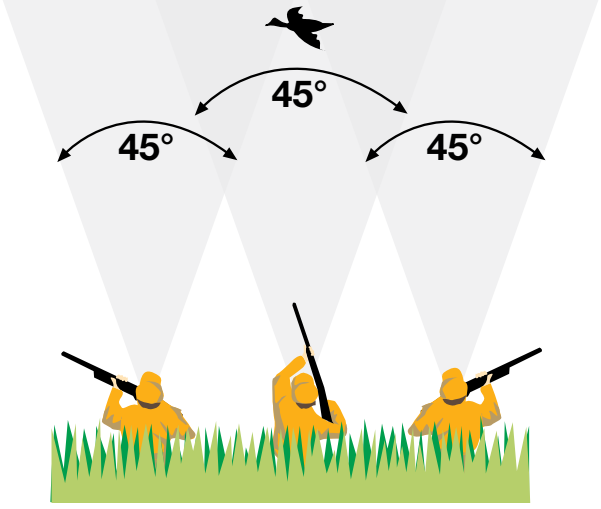
Safe Shooting Zones

Hunting is an enjoyable form of recreation for families and groups of friends. Before they go on a group hunt or drive, responsible hunters will agree in which direction each hunter may fire. This is called a shooter's *zone of fire*. It is common for the most experienced member of the group to personally instruct each hunter on his zone. Following this safety rule will prevent firing in the direction of another hunter. If a shot is not safe, a responsible hunter will not take it.

One example would be three hunters working a corn field for pheasants. They walk 25 to 40 feet (8 to 12 meters) apart in a line. The hunter on the left will carry his shotgun pointing to the left. He will shoot at pheasants in front of him and anywhere to his left. The hunter in the middle will carry his shotgun with the muzzle pointed ahead of him. He will shoot only at birds that rise in the middle and fly straight away. The hunter on the right will carry his shotgun pointing to the right, and will shoot at birds only in front of him and to his right. No one will fire at pheasants above or behind another hunter, or between two hunters. Pass up such a shot so that your shotgun will never point at another hunter. Do not run ahead of the line to chase a downed bird. Do not lag behind the line, putting your companions into your zone of fire.

Another example is the system used in big game hunting. Often, several drivers (people who flush out the game) will still-hunt (move slowly and carefully, watching for game between steps), while pushing game toward one or more hunters on a stand. It is very important to set a zone of fire for each hunter and to know at all times where the stander and drivers are located. No one will fire in the direction of the stander or drivers. Use a visible, distinct landmark for the stander's location, such as a tall, lone dead tree, huge boulder, or steep hill. The still-hunters will take care to remain in sight of the hunters on either side of them. They should move, as nearly as possible, at the same speed. When hunting in dense brush, responsible shooters will identify their target (and determine its sex, if regulations so state) and what is beyond it before making a safe shot. All hunters should wear hunter orange. A large percentage of two-party hunting casualties take place while driving game.



Safe shooting zones for hunters.

Remember, a shotgun's best shooting range is up to 50 yards (46 meters). However, it can shoot 600 or more yards—more than six football fields in length.

A .22 rifle is effective within 100 yards (91 meters) but will fire a bullet over a mile. A big game rifle such as a .270 or .308 is effective to 300 yards (274 meters), but can fire a bullet three miles (5 km) or more.

Responsible hunters will learn both the effective range and maximum range of the firearm cartridge they use. This is important because:

1. It is not responsible or sporting to shoot a bird or animal at distances at which the animal might only be wounded.
2. It is necessary to prevent harm to people who are out of sight at maximum range.

Rough Terrain and Obstacles

North America has some very rugged hunting country. Wild animals like the protection this gives them. They know how to travel safely where you may find it difficult to walk. A safe hunter will take special care in such areas if he thinks he will not be able to control the muzzle direction of his firearm or his balance.

What are the special rules for **obstacles** and rough country?

1. When on a steep hillside, crossing a stream, climbing a tree, or crossing a log too big to step over, unload your firearm. If you slip or fall, be prepared to control the muzzle.
2. Wear nonslip boots or sturdy shoes that give you firm footing and good ankle support. Never run or jump with a loaded firearm.

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3. To safely cross a fence, unload your firearm and break open the action. Reach under the lowest wire and place the firearm on the ground, with the muzzle pointed away from where you plan to cross. Lay the muzzle end on a cap or glove to keep out any dirt. Slide under or between the wires whenever possible, rather than climbing. If crossing a fence in a group, unload all firearms. After one hunter is on the other side, pass the unloaded firearms, muzzles upward, one at a time over the fence. The other hunters can then cross safely.
4. Be sure your firearm muzzle is clear before reloading. If it has been dropped or has touched mud or snow, it could be plugged. Clean any obstruction out before reloading and continuing your hunt.

Unload and open action. Rest your muzzle on a hat.

Preventing Hunting Accidents

Knowledgeable, safe, and responsible hunters are always certain of their target and beyond. This means they will be absolutely certain that their target may be legally hunted and is the proper sex.

Safe hunters will control their emotions. Sometimes a hunter wants to bag game so badly that he will "see" a bush, stump, or another person as a deer. Be extra careful after game has been sighted. This is when you are keyed up and may become overeager. Don't shoot until you can clearly see a whole animal or bird and can properly identify it. If the game goes behind brush, do not fire. Sound or movement might be made by another hunter, and not the game. Remember that other hunters might be stalking the same animal.

Don't take an over-the-hill shot.

When "following" game through your sights, always be sure you are not pointing your firearm at another hunter. Do not take the last chance shot at game going over a hill. Do you know who or what may be on the other side?

Prevent accidental discharge by following firearms safety rules.

Make sure you know how to aim and fire accurately to hit a vital spot on your game animal or bird. A sportsman tries for clean, one-shot kills.

For safety reasons, loaded firearms should not be transported in a vehicle. It is also not safe to step into a boat with a loaded firearm.

Firearm Safety in the Home

Responsible gun handling is not limited to the field. Firearm safety must also be practiced at home. It is sad, but true, that many people are injured or killed in home firearm accidents. However, the student who learns how to handle guns safely in the field can put that knowledge to good use at home.

One way to help prevent home firearm accidents is to use **trigger locks.** These are inexpensive safety devices designed to fit around the trigger guard of a rifle, shotgun, or handgun to prevent the gun from being accidentally fired. There are several types of trigger locks, and an acceptable substitute is a padlock. Slip the locking "bar" through the trigger guard *behind* the trigger. This will prevent the trigger on most firearms from being depressed far enough to allow the gun to accidentally fire. There are other locking devices available, as well. For example, the Cable Lock is a gun safety device that is similar to the cable you would use to lock up a bicycle.

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Open the action of a shotgun or many bolt-action rifles, semi-automatic pistols or revolvers and run the cable through the openings, then lock it. This prevents the action from being closed on a live cartridge and being accidentally fired.

Never show firearms to your friends without adult supervision. If your friends come over after school or on weekends, and they ask to see a gun, be sure to have your parent or another adult present. Remember, you were once very curious about guns, so it is natural that your friends will share that same curiosity. Just remember, your hunter safety training has taught you things about safe gun handling that your friends probably don't know. Also, they may have questions about gun safety that only an adult can answer. Even more important, the presence of an adult can discourage someone who is not familiar with firearms from treating them like toys.

Always keep the muzzle pointed in a safe direction. This rule applies equally to the home as it does to the shooting range or in the field.

In the home there are some "extra" things to consider, however. For example, if you live in a two-story house, or in an apartment with neighbors living upstairs or downstairs, you must be careful about pointing the muzzle up or down. An accidental discharge could send a bullet through your ceiling, and your upstairs bedroom floor! This is the prime reason that you never hand a firearm to anyone without first checking to make certain that it is not loaded. A good idea is to always try and keep the muzzle aimed at an angle so that it is pointed either at the corner of the room where the ceiling or the floor comes together with the wall. The reason for this is that in these areas, there are usually several crossbeams of wood, top and bottom, which support the wall studs. These thick layers of lumber, usually 2 X 4s nailed together, can often stop an accidentally fired bullet.

Always have the action open for display. If you show firearms to a visitor, always open the action first to make sure the gun is not loaded. Only then do you hand it to your guest, and he or she should keep the action open. This rule applies to all guns, whether they are break-open shotguns, bolt-action rifles, or revolvers. And, when you hand over a firearm to a visitor, keep the muzzle pointed in a safe direction.

Cleaning and Storage

Why is it important to take care of your firearms? You can help it last a lifetime with good care. A clean firearm is the safest to use. A clean firearm safely stored is owned by a responsible hunter.

Your firearm should be cleaned after each trip. Clean it even if you did not fire it. Always make sure your firearm is unloaded before you clean it. A good rule is, "Take two seconds to be safe instead of forever being sorry." Brush dirt, sand, and leaves from the action and barrel. Use **solvent** to clean the bore. Apply a light coat of oil inside and out. Then your firearm is ready for storage.

It is important to store your firearm in a safe, dry place. A horizontal rack is fine. A cased firearm should be muzzle down. This prevents cleaning fluid and oil from settling into the action.

Do not leave a firearm in a closed case for a long time. A closed case traps moisture. This could rust your gun.

Never have a loaded firearm in your **vehicle**. Learn the laws about traveling with a gun.

Store firearms and ammunition separately. Remember one of the first rules you learned during hunter education class. Always keep your firearms unloaded and stored separately from ammunition when not in use. In many homes, you will find ammunition locked in a separate drawer or ammunition locker, away from gun cabinets. In other homes, the ammunition is simply placed in a separate location. The result is the same: Guns and ammunition are not immediately accessible in the same place, and this reduces the possibility that someone unfamiliar with guns could foolishly load a firearm in the home and accidentally fire that gun. Many gun cabinets and gun safes have lockable storage drawers for ammunition, and you should remember to use those locks.

Some people take an additional safety precaution with bolt-action rifles by removing the bolt and locking it in a storage drawer as well.

The golden rule here is: You can never be *too* safe about storing or showing your firearms.

Arrows, Knives

Safety in the home goes beyond the safe storage of firearms and ammunition. If, for example, you or a member of your family is a bowhunter, it is very important to store your hunting broadheads safely, where

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visitors, and especially small children, can't easily or accidentally find them.

Hunting broadheads are extremely sharp and, when handled improperly, can cause severe cuts. Therefore, they should be stored in containers designed specifically for broadhead storage. These are available at virtually any good archery shop or sporting goods store that sells archery equipment. These containers usually have a foam interior into which the broadheads are gently inserted until they are unable to rattle around loose. There should be a lid that can be closed tightly. If you do not have such a container, it's easy to make one by cutting a piece of foam to fit a shoe box. Once your broadheads are safely placed inside, close the lid and either tape it, tie it, or close it with heavy rubber bands.

Knives may also cause accidents when improperly handled. When storing a hunting knife, it's a good idea to wipe the blade with a thin coat of oil, then put it back in the sheath, snap the safety strap closed, and put the knife in the same cabinet where you store your firearms.

Many gun safes have shelves that are perfect for this purpose. The oil will help prevent rusting that can be caused by moisture that can't evaporate through the leather, or even nylon sheath material.

Gun safe.

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FIREARMS SAFETY—Review

1. What are three major causes of hunting accidents and how could you prevent each of them?

_____

_____

_____

2. Finish each of the following safety sentences:

Treat every firearm as if _____ .

Whenever you handle a firearm, be sure to control the _____ .

Always be sure of your target, and _____ .

3. Name five different methods of carrying a firearm and a time when each could be used.

_____

_____

_____

_____

_____

_____

4. Why is it important to know the correct steps for loading and unloading any firearm?

_____

_____

5. What is a safe shooting zone (zone of fire)?

_____

_____

6. What should be done with any firearm before you hand it to someone or accept it yourself?

_____

_____

7. Name two safety procedures for storing firearms.

_____

_____

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4 Specialty Hunting

Muzzleloaders—Key Terms

Black powder—Granulated powder made of charcoal, sulfur, and salt peter; used in muzzleloaders.

Flintlock—A muzzle loading firearm that uses flint to ignite the priming powder.

Hangfire—Delay in ignition.

Long starter—Wood or metal rod used to push the ball and patch down the barrel of a muzzleloader.

Misfire—Failure to fire.

Muzzleloader—Firearm that is loaded through the muzzle instead of the breech.

Patch—Piece of material added to a slightly smaller ball, which cleans the barrel, seals tiny gaps, and makes rifles easier to load.

Percussion cap—Cap placed on the nipple under the hammer of a muzzleloader. The cap explodes when hit, sending the flame to the main powder charge, which fires the firearm.

Powder horn—Container used to hold black powder, not to load it.

Primer—Explosive cap used to ignite the powder when struck with a sharp blow from the firing pin.

Ramrod—Wood or metal rod used to push the ball and patch down the barrel of a muzzleloader.

Short starter—Short rod used to press the patched ball just into the muzzle when loading a muzzleloader.

Muzzleloading

Introduction

Muzzleloaders are firearms that are loaded through the muzzle. Each component is loaded directly into the barrel.

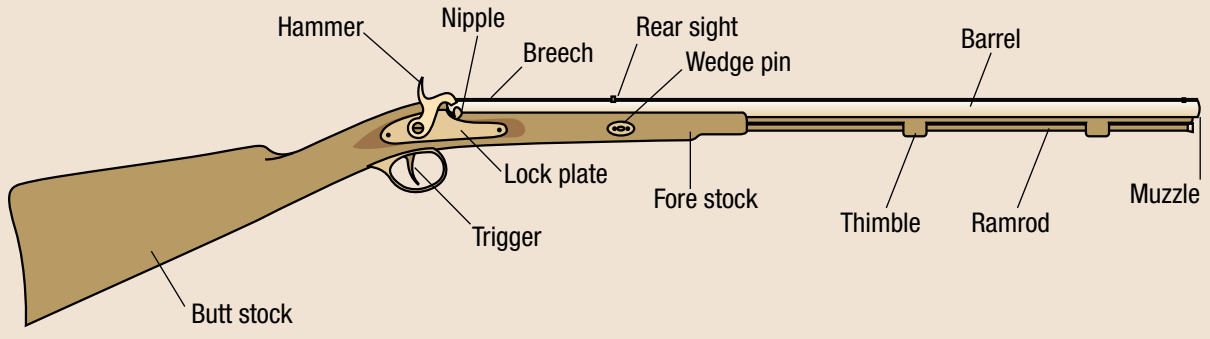
Hunting with a single-shot muzzleloader is challenging. Well-honed hunting skills are required in order to move within the effective shot range of 50 to 75 yards with a one-shot firearm. It is important to correctly place that shot in a vital area.

Selecting a Muzzleloader

Select a gun suited to the game to be hunted:

- Small game (javelina, coyote, groundhog)—.45 caliber and larger; rabbit, squirrels—.40 caliber and under, or 12 gauge or smaller, #6 or 7+ shot
- Game birds—any light, fast-pointing double barreled shotgun; grouse or quail—12 gauge or smaller, #6 or 7 + shot; pheasant—12 gauge, #5 or 6 shot; turkey—

Parts of a Percussion Rifle



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10 or 12 gauge, #4 or 5 shot, full choke, ducks—#4 nontoxic shot; geese—#2 nontoxic shot.

- Deer (similar sized animals)—.45 caliber and larger.
- Big game (elk, moose, boar hog)—.50 caliber and larger (heavy charge).
- Large game (bear, water buffalo)—.54 to .58 caliber (heavy charge).

Select a muzzleloader that feels comfortable and fits:

- Firearm's overall weight and length.
- Trigger easily reached when stock is shouldered.
- Stock shape allows the sighting eye to align with the front and rear sights when the stock is against the shoulder and cheek.
- Type and placement of sights.
- Barrel twist, projectile, caliber, or gauge needed for the intended use.
- Type and amount of powder for an accurate load.
- Trigger guard space ample for a gloved finger.

Before and after selecting a muzzleloader, read and follow the manufacturer's recommendations. The care and use of the firearm are covered in detail in this material.

Powder for Muzzleloaders

Black powder and some newer commercial synthetic black powder substitutes are the only powders that can be used in a muzzleloader. Black powder (FFFFg) should be used for priming in flintlocks since it ignites more easily than most synthetics.

Both black powder and the synthetics burn with explosive force. They are sensitive to sunlight, heat, sparks, pressure, impact, and static electricity. Do not store powders in glass or plastic containers because they are capable of producing static electricity. Store powders in their original containers with the grade and granulation plainly labeled. Carry just enough powder for the hunt.

Keep the containers tightly sealed. These powders absorb moisture. Damp powder will not ignite. Once it has dried, however, it is once again flammable.

Percussion caps are coated inside with an explosive substance. Be sure to carry and store caps away from powder.

Powder Granulations

Black Powder	Pyrodex®	Use
Fg	CTG	Musket and shotgun 10 gauge and larger.
FFg	RS	Rifle and pistol .45 caliber and larger. Shotgun 20 to 12 gauge.
	Select	Match grade RS
Cartridge		Between FFg and FFFg.
FFFg	P	Pistol and rifle .45 caliber and smaller.
FFFFg		Priming powder ONLY.

Check your hunting laws to make sure the use of Pyrodex® is permitted.

Smoking is very dangerous around black powder. Avoid all sources of heat or flame.

Smokeless powder used in modern firearms is also dark in color. Color does not make a product safe to use in a muzzleloader. The chamber pressures generated by modern powder are too strong for muzzleloader barrels. **Use ONLY black powder or a synthetic black powder substitute in a muzzleloader.**

Black powder and synthetic powder are often used in equal volume. Each powder charge must be measured. Use a separate measurer with a funnel for each. Suggested starting loads in grains of black powder, are:

- **Rifle**: 1 grain per caliber. (Example—.50 caliber use 50 grains)
- **Handgun**: ½ grain per caliber (Example—.45 caliber use 22 grains)
- **Shotgun**: 75 grains for a 12 gauge with 1⅛ oz. #6 shot. Use the same dipper to measure equal amounts of powder and shot.

FFFFg powder creates unsafe chamber pressures and must NOT be used as the main powder charge in a muzzleloader. The result could damage the muzzleloader and/or cause injury or even death to the shooter.

Eye protection is needed when loading and shooting muzzleloaders. Eye injuries are possible from powder being blown by a breeze during loading, flint chips created when the flint strikes the frizzen, and exploding cap fragments.

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Barrels

Shotguns have thin-walled barrels because shot loads develop less chamber pressure than solid projectiles. Solid projectiles require a barrel thickness about twice the diameter of the projectiles at the breech. (Example: A .50 caliber should be about one inch in diameter.)

Make sure the barrel is sound, free of obstructions and unloaded before loading. Place the ramrod in the barrel and mark it at the muzzle with a marking pen. When placed along the outside of the barrel, the ramrod should reach from the mark at the muzzle to the flintlock touchhole or the nipple to indicate that the barrel is clear. ***Do not try to clear an unknown load from a barrel by firing. Do not attempt to load or shoot a gun if the barrel is badly corroded, badly fouled, or obstructed—consult a gunsmith.***

Consult a qualified gunsmith before shooting any old or unfamiliar firearms. Old metal is known to become fatigued and originally was probably not as strong as modern steel.

Start each day with a clean muzzleloader. Wipe the bore with an alcohol patch before pouring that first main charge down the barrel. Cleaning is essential. Black powder and synthetic powder residue are extremely corrosive. Pitting is a result of corrosion. Loss of barrel soundness and accuracy are effects of pitting. Unsound barrels should not be used.

Unload and clean the firearm at the end of each day's hunt with soap and water. Dry thoroughly and lightly oil metal parts. Store with the muzzle pointed down.

Develop an effective load. Spend neither time nor money on speed loading. Learn to make the one shot of a muzzleloader count. Practice shooting from different positions such as leaning left or right, sitting in a tree stand, sitting against a tree trunk, and up and down hill from your target.

Basic Accessories

- Manufacturer's instruction book
- To prepare a load:
  soft cotton flannel cleaning patches
  cleaning patch jag
  worm or ball puller with bore guide collar (patch retriever)
  alcohol (removes oil and displaces moisture)
- To load:
  Blackpowder or Pyrodex®
  powder measure with funnel
  lubricant for patches and projectiles
  proper size percussion caps
  FFFFg priming powder in a small horn or flask
  handgun loading stand
  v-notch loading board and clamp for long guns
- Support supplies:
  CO_2 discharger (quick, easy and safe)
  vent pick
  pipe cleaners
  nipple wrench
  extra nipple
  extra flint and pad of lead or leather
  screwdriver
- Rifles and pistols:
  faucet washer to fit over nipple or leather frizzen boot
  projectiles of pure soft lead
  patching of 100% cotton or linen in a strip or pre-cut (prelubed or unlubed)
  patch knife when strip patching is used
  ball starter with a ½" and a 4" shaft
- Shotguns:
  dipper measure for powder and shot
  overpowder card (⅛" thick)
  container or pouch of shot
  overshot card (1/16")
  lubricated filler wads (½")
- Revolvers:
  12-inch cleaning rod
  oversized pure soft lead projectiles
  overpowder filler wads or cornmeal
  capper with proper size caps
  grease for front of each chamber
- To wipe between shots:
  soft cotton flannel patches
  black powder solvent bore cleaner
- For cleaning after shooting:
  T-handle workrod with bore guide
  soft cotton flannel cleaning patches
  1-gallon plastic milk jug (top cut out)
  water
  nonabrasive soap
  toothbrush
  shotgun bore mop
  brass brush
  toothpicks
  oil for metal (not water soluble)
  wood care product

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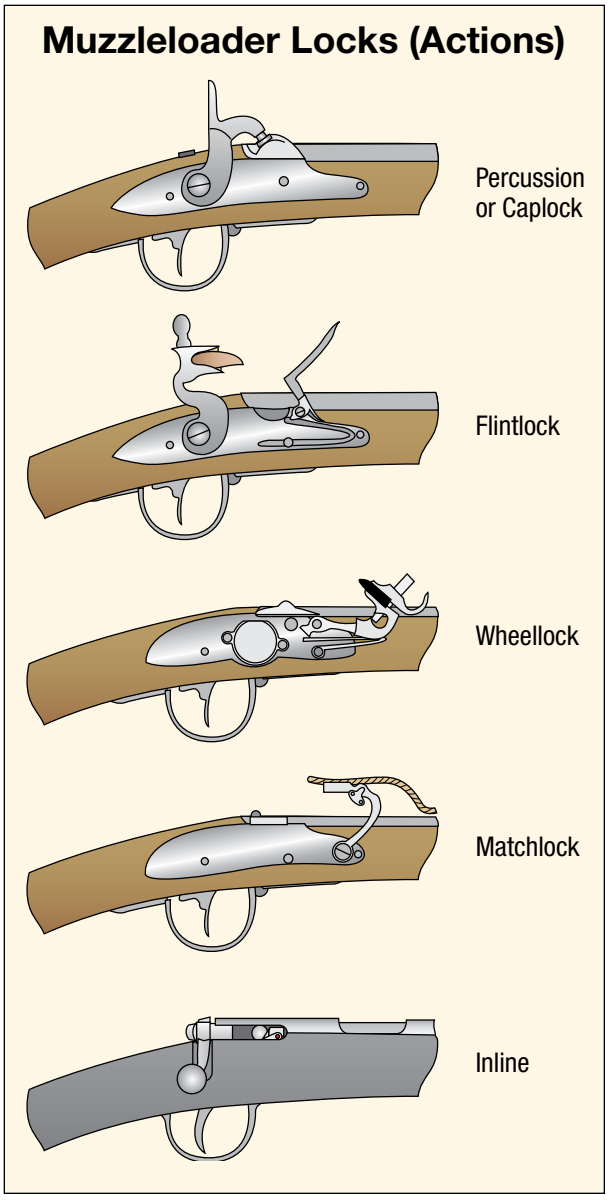


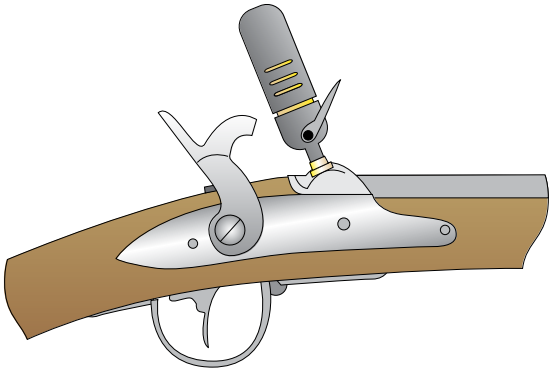
Load only after arriving at the hunting site as the hunt begins. Cap or prime only when ready to shoot. Any firearm with a projectile in the barrel is loaded.

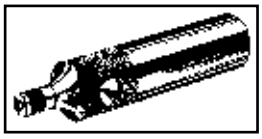
Hangfire is a short time delay between the fired cap or priming powder and the firing of the main powder charge—a snap, then a boom!

Misfires occur when the primer ignites but the main charge fails to ignite. Cap and shoot again. Repeat capping and shooting two or three more times. When the main powder charge fails to fire, the projectile must be removed from the barrel. Keep a firm grip on the firearm and point the muzzle in a safe direction until the projectile is removed from the barrel.

Pulling a projectile out of the barrel is dangerous when there is a powder charge in the barrel. There are three methods approved for removal of a projectile from the barrel:

1. Use a CO_2 discharger:
2. Use the touchhole pick to work a few grains of powder through the touchhole of the flintlock, or remove the percussion nipple from the drum or bolster and use the pick to work a few grains of powder in behind the projectile. Clean the threads before replacing the nipple, cap or prime again, reseat the bullet on the charge, and shoot; or
3. Carefully remove the nipple from the barrel and then remove the barrel from the stock. Place the breech end of the barrel in eight inches of water to soak (deactivate) the main powder charge for about an hour before pulling the projectile.
4. **Use a decapper** made of bone, brass, or wood when removing a live percussion cap. This will prevent creating a spark while prying a cap off the nipple. A cap may explode from a spark or pressure. Carry and store caps separately from black powder or black powder substitute.





A CO_2 discharger is a little device used to remove projectiles from the bore without firing the firearm. It is a safe, quick, quiet and hassle-free method of unloading. CO_2 cartridges and adapters for all ignition systems are available. Be sure to have a CO_2 discharger and some extra CO_2 cartridges handy before loading any muzzleloader.

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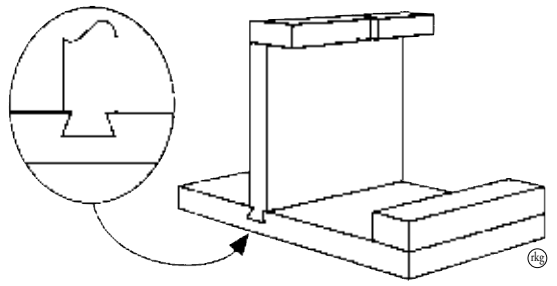
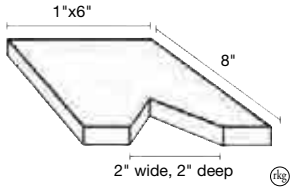
Handgun Loading Stand



V-Notch Board



Rifle Between Knees

Handgun Between Knees Angled Away from Face

Loading

You will need to have both hands free when loading. At the range, clamp a v-notched board to the loading bench. Rest the barrel of a long gun in the V-notch when loading to prevent it from falling. Use a loading stand when loading handguns. In the field, rest the butt of the long gun firmly on the ground and support it between the feet to prevent slipping. Grip the forestock between the knees with the muzzle of the barrel directed away from the face.

To load a handgun in the field, kneel down, place the handgrip firmly on the ground and support it between the knees with the muzzle of the barrel directed away from the face.

Loading should take place at least eight feet away from those engaged in shooting. This is done to prevent sparks created during firing from igniting powder used during loading.

Blowing down the barrel is hazardous to your health. Point the muzzle ONLY at the intended target.

Half cock is a mechanical device subject to failure. The hammer of the percussion muzzleloader is placed in this position only to load. **Never carry a gun with the hammer down on the cap. Place a faucet washer on the nipple before lowering the hammer to prevent sparks from friction.** ***Cap or prime only when ready to shoot.*** To load a flintlock muzzleloader, open the frizzen and place the cock down.

Revolver chain-fires occur when a spark enters the chamber through the nipple channel. Tightly cap all loaded chambers. Lubrication on the front of each chamber softens the fouling.

Read and follow the firearm manufacturer's recommendations. Know and understand the firearm before loading and shooting.

Regard this information as ONLY an introduction to muzzleloading. For more information contact:

National Muzzle Loading Rifle Association
P.O. Box 67
Friendship, IN 47021
812-667-5131

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Bowhunting—Key Terms

Arrow—Slender shaft, pointed at one end and feathered at the other, for shooting from a bow.

Bow—Device for shooting arrows. Types include straight limb, recurve, and compound.

Bow stringer—Piece of heavy test nylon with a leather pouch at both ends, used for stringing a bow.

Broadhead—Arrowhead used for hunting.

Draw weight—How many pounds of force it takes to draw the bowstring a certain distance.

Fletching—Usually three feathers on the end of an arrow shaft. It includes a "cock" feather which is used for alignment.

Nock—To place the fingers in a bow shooting position, holding the bowstring and arrow properly. Also the notch at the end of an arrow.

Point—Sharp end of an arrow. Types include conical, blunt, or broadhead.

Quiver—Container for arrows.

Bowhunting

Introduction

After the development of reliable firearms, bowhunting became a minor sport enjoyed by only a few people. From the 1900s on, and particularly in the last 30 years, bowhunting has again become very popular as more hunters take up the sport. Some states and provinces have numerous bowhunters. In many areas, there are early and late seasons for bowhunters only.

There are several advantages to hunting with bows. Bowhunting seasons may extend the opportunity for hunting by adding extra days to the regular season. Bowhunting skills can help to improve the hunter's skill level. Bowhunting is a quiet sport. Of the few bowhunting accidents, most are self-inflicted.

Bowhunting requires practice in shooting, study of game sign, patience, and ability to trail game. There are courses which teach these skills. The most widely accepted of these is the International Bowhunter Education Course, found in most states and provinces.

Archery ranges, bowhunting clubs, archery dealers, and school programs can also help you learn about proper bowhunting equipment.

Basic Equipment

All bowhunters need a good quality bow, arrows, a quiver that covers **broadheads**, a spare bowstring, arm and finger protection, proper clothing, and a license.

Field equipment for bowhunters should include much of the same basic survival and outdoor equipment needed by firearms hunters. The bowhunter will also need some special equipment, such as sharp broadheads. A small backpack or a fanny pack is helpful for carrying bowhunting equipment. Your pack should not make noise nor interfere with your movements.

There are three popular types of modern bows: *straight limb* or *long bow*, *recurve bow*, and *compound bow.* The National Bowhunter Education Foundation (NBEF) does not consider the *crossbow* a bow because it can be mechanically held in a drawn or cocked position. However, the crossbow is a legal hunting tool in Wyoming and some other areas.

Legal requirements for bowhunting equipment vary. Responsible bowhunters read the bowhunting regulations of their state or province to see what licenses or permits are required. There may also be specific equipment regulations.

Your equipment should be matched. Select a bow which you can shoot well. Go to a good dealer and have him assist you in selecting a bow and determining your draw length. Next—and most important—choose *arrows* having stiffness matching the bow's draw weight. Arrow shafts may be made of wood, aluminum, fiberglass, or graphite. Fiberglass and aluminum arrows cost more than wood arrows, but do not break or warp as easily. Of course, the arrows must be straight and each hunting arrow must be checked.

The length of the arrows should match a hunter's draw length. The average length of arrows is about 28 inches (71 cm).

It is best to practice with broadheads like those with which you intend to hunt. If you must use field tips

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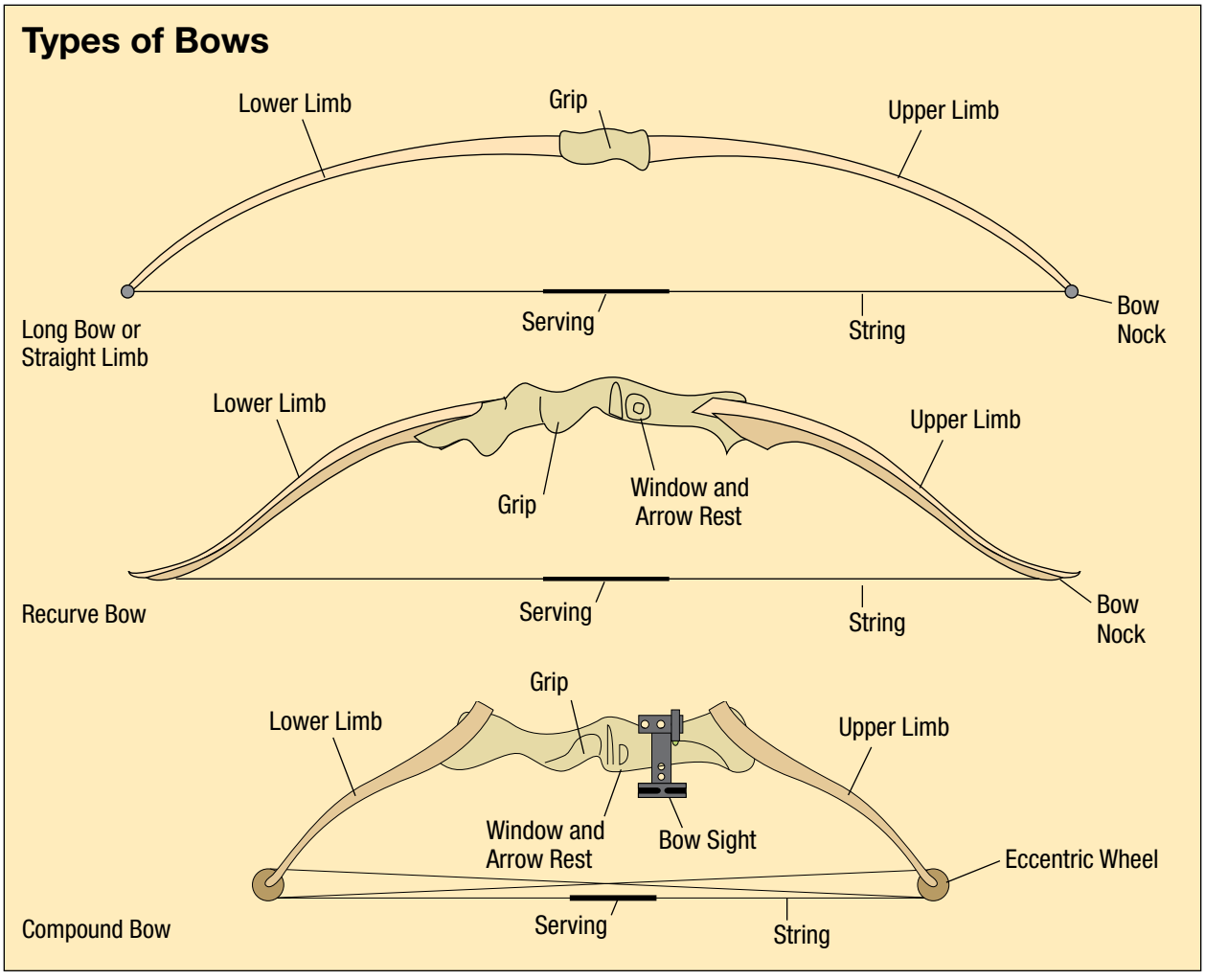

for practice, be certain they are the same weight as your broadheads.

Each arrow has a *nock*, or slot, that is positioned on the same place (nocking point) on the bowstring for each shot. This generally is a point on the bow string about ¼-inch (6 mm) above the bow's arrow rest. You can have a professional mark this spot for you. The nock is usually centered between the first two fingers of your shooting hand.

Arrows have fletching next to the nock *Fletching* is three to six vanes of feathers or plastic that help it to fly straighter by spinning it in flight.

The point, or broadhead, is at the opposite end of the arrow shaft. Many different types of points are used, depending on whether you are target shooting, small game hunting, or big game hunting. A broadhead width of at least 1 inch is needed for big game. Effective hunting broadheads are razor sharp and should be kept that way.

Some bowhunters use *bow sights* while others shoot instinctively, using no sights at all. There are also range finder sights available.

Learning to judge distance and practicing shooting from tree stands and various positions on the ground improve a bowhunter's success rate.

Safe, knowledgeable hunters will keep their equipment in top condition. Long and recurve bows should never be stored while strung. All arrows should be checked often for warping, cracking, or bent nocks. Bad arrows should be broken to prevent accidental use. Broadheads must be razor sharp. Worn bowstrings should be replaced.

Bowhunting Safety Rules

There are seven basic steps in shooting a bow: *position, nocking, drawing, aiming, holding, releasing,* and *follow-through.* You should keep in mind all common

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hunting safety rules when bowhunting. There are special bowhunting safety rules also. The first of these is to be very careful when handling, storing, and sharpening broadheads. You should check your equipment often, especially before each hunting day. Be sure to follow the proper steps in stringing a bow. Use a bow stringer to avoid personal injury or damage to your bow.

In the field, responsible bowhunters will remember and practice these rules of safety:

1. Identify the target.
2. Be sure of a safe path for the arrow to the target.
3. Check for proper bow limb clearance from any brush or branches.
4. Nock arrows only when getting ready to shoot.
5. Never "play" with bows and arrows by pointing at someone or shooting straight up.
6. Do not take any over-the-hill shots at disappearing game. (A modern bow can shoot an arrow over 200 yards, or 182.88 meters.)
7. Cover the broadheads completely. Hunting quivers should hold your arrow securely.

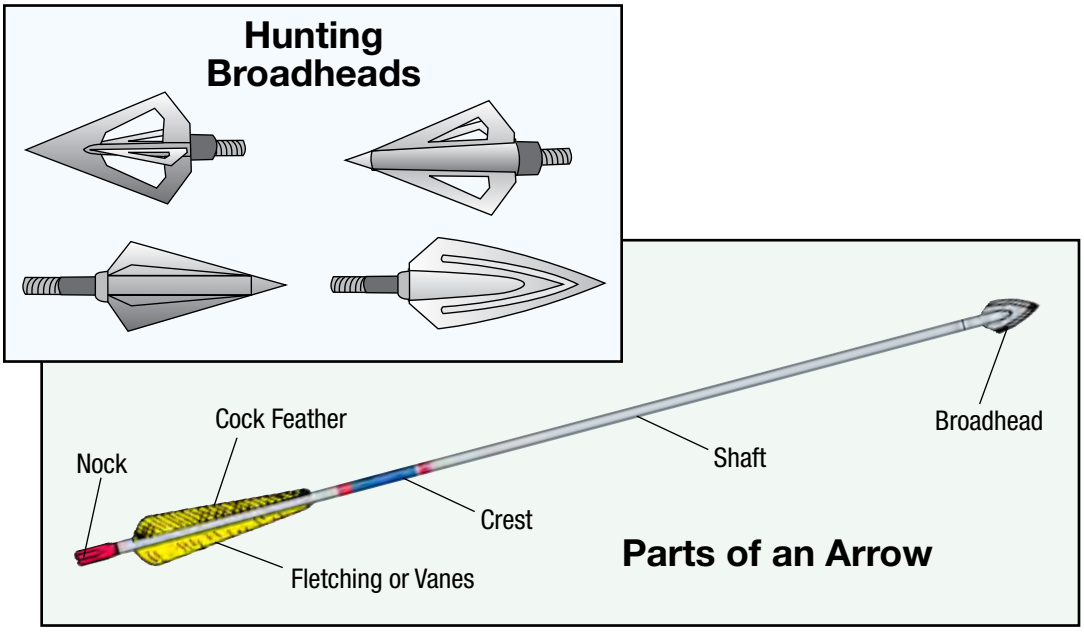
When drawing the *bowstring* for a hunting shot, keep your movement to a minimum. Draw when the game is looking down or away from you and only when it is within range. Select a vital spot as your aiming point, not the whole animal. Relax your fingers and release the bowstring smoothly.

Always place your arrows in a safe, secure, and covered *quiver* when not in a shooting situation. Never walk with a nocked arrow. It is important to transport your bowhunting equipment safely in a vehicle so that it is not damaged and will not hurt anyone. Check your regulations book for specific laws about carrying bows in vehicles.

Field Considerations

Safe and responsible bowhunters will take only shots that are within their effective range. Bowhunters take big game at less than 30 yard (33 m) in cover and 40 yards (37 m) in the open. You should practice on life-sized targets, aiming for a vital area (heart, lungs, liver).

Always remember to carry your arrows in a covered quiver until reaching your blind, stand, or stalking area.



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SPECIALTY HUNTING—Review

1. What are the two general types of powder that can be used in a muzzleloader?

   _____ _____

2. Why should a muzzleloader be cleaned daily when it is being used?

   _____

   _____

   _____

3. Describe a “hangfire” and a “misfire” when using a muzzleloader.

   _____

   _____

   _____

4. Name three different types of hand-operated bows.

   _____ _____ _____

5. Name four main parts of an arrow.

   _____ _____ _____ _____

6. When bowhunting, name the *only* time an arrow should be nocked.

   _____

   _____

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5 Wildlife Identification

Wildlife Identification—Key Terms

Antlers—Bony structures that grow out of bone pads or lumps on the head of animals in the deer family. Antlers are shed annually.

Carnivores—Meat-eating animals.

Cud-chewers—Animals which, after eating, bring their food up into their mouths to be chewed a second time (ruminants).

Diving duck—Duck which favors lakes and deep ponds, and which runs along the surface of the water to get airborne. These ducks feed by diving.

Herbivores—Plant-eating animals.

Horns—Hard, fiber-like material growing around a core of solid bone on the skull of some mammals. With the exception of the pronghorn, horns are not shed.

Omnivores—Animals which eat both plants and animals.

Puddle duck (dabbling duck)—Duck which favors shallow ponds and marshes, and which springs directly into the air to fly. Puddle ducks feed by dabbling or tipping.

Upland bird—Chicken-like birds with short rounded wings and heavy bodies, such as grouse, pheasant, quail, and turkeys.

Warm-blooded—Having a natural constant internal body temperature.

Waterfowl—Water bird or birds, especially those that swim. Ducks and geese are examples.

Introduction

Wildlife study can be fun and rewarding all year long. Knowledgeable hunters will study wildlife whenever they can. Responsible hunters know the habits, sounds, and behavior of the wildlife they hunt.

There are over 400 mammal **species** and more than 600 land-nesting bird species in North America. Of this number, only those species with extra numbers are hunted. All hunting is covered by state, and sometimes federal, laws and regulations.

To enjoy safe, legal hunting you should be able to recognize wild animals.

A responsible hunter will read books and magazines that tell about game and nongame species found in his area. Field guides are good, helpful tools. There are wildlife films and TV programs that show how wildlife lives, and the habitat each bird or animal likes best.

Responsible hunters will never shoot at something they cannot positively identify. It is important to identify an animal before you pull the trigger. Wildlife identification is a skill, developed by studying each animal's *physical characteristics, coloration,* and *tracks*. It takes practice to learn wildlife identification skills.

Each species of wildlife has characteristics that are different from all others. These differences can be noticed in the horns, antlers, hooves, paws, claws, teeth, tail, and/or ears of an animal. Other clues are given by an animal's size, shape, color, and habits.

Knowing how to identify wildlife will help you to know if animals are game or nongame. You must learn the difference to be sure that you hunt only legal wildlife.

All game species may be taken legally only during specific seasons. Bag limits and possession limits are regulated.

A responsible hunter will study habitat needs of the animals he hunts. A knowledgeable hunter also recognizes that loss of habitat is the biggest threat to wildlife today.

When learning to identify wildlife, it helps to divide them into groups of similar species. Most guidebooks use five major categories:

1. Large mammals.
2. Small mammals.
3. Upland birds.
4. Waterfowl.
5. Rare, protected, or endangered species.

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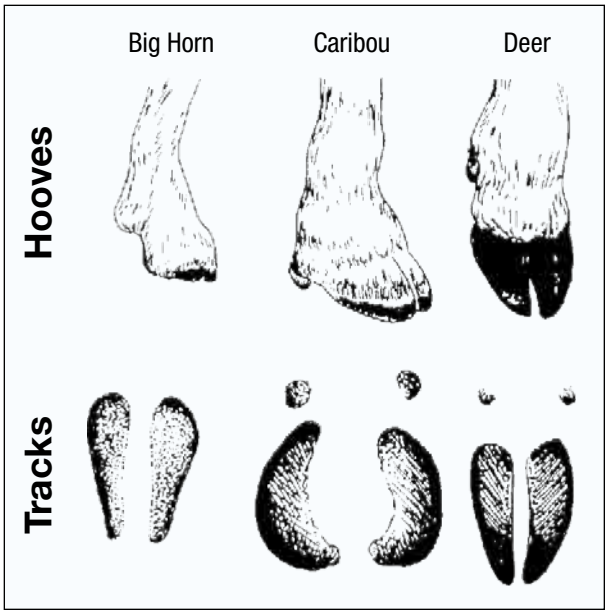

Large Mammals

There are general **characteristics** which mammals share. Mammals have *vertebrae* (backbones), give birth to live young, feed their young with milk from *mammary glands*, and are *warmblooded*. Most of them are covered with hair or fur. Large mammals in North America include *family* groups such as deer, bear, cat, and dog.

Young mammals grow inside the female's body for a period of time. After birth, most young mammals are taken care of by the adults for some time. For the large mammals, this ensures a higher survival rate. The good care and corresponding high survival rate are made possible by the fact that large mammals do not give birth to many offspring at once. For example, most healthy doe deer will have only two fawns, and very rarely three.

Moose, elk, and deer are all members of the deer family. They are called *cloven-hoofed* because each hoof has two parts. Other animals that have cloven hooves are North American wild sheep, goats, and pronghorns.

All of the animals in the deer family are called *cud-chewers*. Members of the deer family may feed on grass, low growing vegetation, or the leaves and twigs from low-hanging trees. Their large stomach has four parts. They have to chew their food twice to digest it. They will feed, return to resting spots, and then bring up the food into their mouths to be chewed a second time.

Cud-chewers have broad, flat teeth best suited for chewing. They do not have upper front teeth. Instead, they have a hard plate or pad that helps them roll and crush their cuds.

Members of the deer family have antlers. *Antlers* grown by moose, elk, and deer are shed each year. Antlers are bony structures that quickly develop from bone pads or lumps on a male deer's head. Except with the caribou, the female of deer species do not have antlers. In spring and summer antlers are very tender, and covered with a velvet-like coating. This covering is the source of rich blood vessels and nutrition for the growing antlers. The size of antlers is determined by heredity, diet, and the animal's general health.

The number of points on the antlers does not always show how old an animal is. As deer get older, they usually grow more points on their antlers. But this reverses with age, and a very old deer might have only a small set of antlers. By fall, the antlers are hard, bony, and often

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very sharp. Buck deer, bull elk and moose will rub and hit their antlers against small trees and brush to mark their territory. This also removes the soft covering and polishes the antlers. Hunters finding many "rubs" may find several bucks in the area.

Horns are bone cores covered with horny sheaths made up of hair or keratin (a protein). A mountain sheep or goat starts growing horns when it is about six months old. Growth rings near the base of the horns show the age of a sheep or goat. Usually a new ring appears each year, while the bony core grows larger and stronger. Males have the larger horns. These will curve and spiral back and around each side of the head. Females have smaller horns that curve backward like half-moons. Sheep and goat horns continue to grow each year. They are not shed.

The pronghorn is found only in North America. Its horns are covered by a sheath of compressed hair. The sheaths are shed each year. Usually the male pronghorn grows larger horns than the female.

Some mammals are *carnivores*, (meat-eating animals) such as wolves and mountain lions (also called cougar or puma). Bears are *omnivorous*, meaning they eat both plants and meat. Bear teeth, like human teeth, are able to cut, tear, crush, and chew food. Wolves and the big cats have sharp teeth, better for cutting food than for chewing. Some states permit hunting for these species and some do not. It is your responsibility to know whether they may be legally taken in your area.

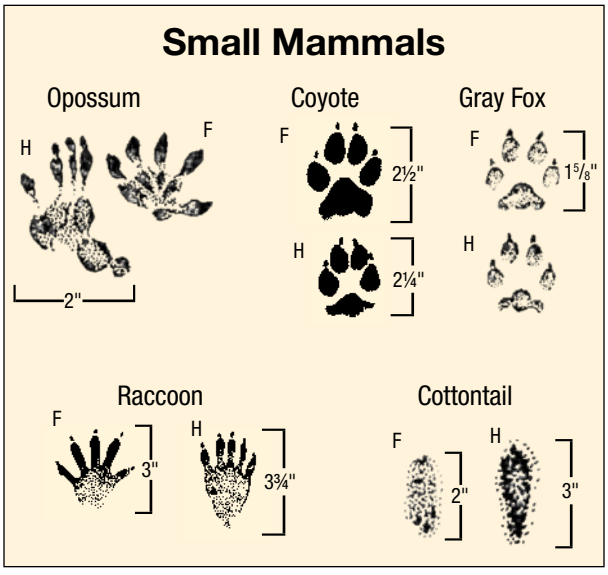
Small Mammals

Like the large mammals, small mammals have backbones, give birth to live young, feed their young with milk from mammary glands, and are warmblooded. They are covered with hair or fur.

Almost all young hunters are familiar with smaller game such as cottontails, snowshoes (varying hares), jackrabbits, and squirrels. As food species, these are found in nearly all of North America and are heavily hunted.

Small mammals live a short life. The smaller they are, the higher their birth and death rates are.

Small mammals leave distinctive tracks behind them in soft ground, mud, or in snow. A hunter skilled at reading sign can tell many things from a careful study of the tracks. It is possible to learn what animal made the track, how old the track might be, and, from the spacing, whether the animal was walking or running.



In some cases, small mammals, such as the weasel, mink, muskrat, and marten, are called furbearers. Check your local regulations to see what classification these small mammals are in your area and whether they can be hunted or trapped.

Upland Birds

All birds are warmblooded animals covered with feathers. Most species have more than one covering of feathers (plumage).

Pheasant, ptarmigan, grouse, quail, partridge, and turkey species are examples of upland birds. They are found across most of North America. The turkey is the largest ground nesting bird and is found in every state except Alaska. From a low of about 6,000 turkeys left in the late 1800s, turkey populations have increased to about 2,000,000.

The ring-necked pheasant, chukar, and Hungarian partridge are species that have been imported to America.

In some upland species, such as the grouse, male and female birds look much alike. Others, such as pheasants, have males with bright, distinctive colors and females with drab colors.

The male turkey is best identified by its long beard. In spring, the male turkey's *wattles* (fleshy growths under the head on both sides of the neck) turn bright red and his feathers show a shiny bronze color. This display is most easily seen when he spreads his tail feathers to strut during the mating period.

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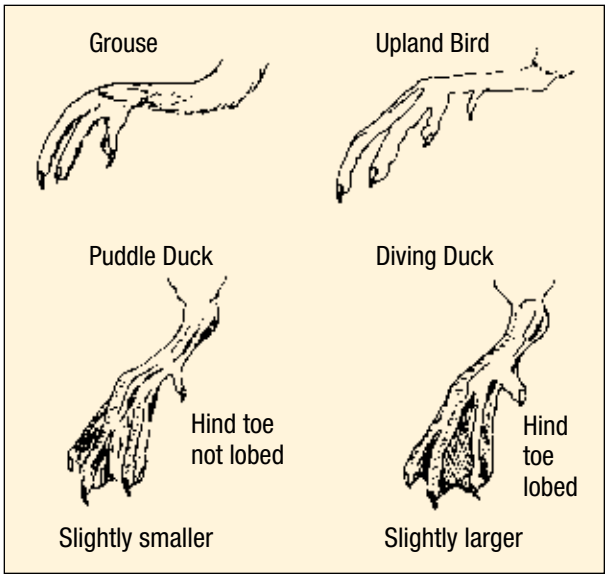

Upland birds nest each spring and hatch their young from eggs. Sometimes a mated pair produces a second, late hatch in summer. By fall the young birds have all of their feathers.

Most male upland birds have bright *plumage*, which attracts their mates. The females' plumage blends into the background as **camouflage**, helping to protect nesting sites.

Upland birds are shaped like chickens and have short, rounded wings, short heavy bills, and heavy bodies. Their sturdy legs are good for running and scraping. Upland birds look for cover in brush or woodlands. They nest and feed on dry ground, but may live close to water. Most of these birds do not *migrate*.

Waterfowl

Migratory birds that live on or near water are of both game and nongame species. The game birds—geese, ducks, coot, rail, and snipe—number in the millions. There are other species such as cranes, swans, grebes, and small shorebirds that are hunted only in some areas.

Migratory waterfowl can live in many different kinds of habitats. But many of these habitats have been threatened by home-building, city expansion, more use of crop land, and draining of marshes. As with all wildlife, elimination of habitat or of necessary food is a threat to any bird species.

Different waterfowl need different kinds of habitat. *Diving ducks* live on lakes and deep ponds and feed by diving under water. Pintails and mallards often are called *dabblers* or *puddle ducks* because they live on shallow ponds and marshes. They feed by dabbling, or tipping over.

Another way of knowing whether a duck is a diver or a puddler is to watch how it takes off from water. A diving duck runs along the top of the water to get into the air. Puddle ducks spring into the air.

Puddle ducks have a bright patch of feathers midway on the trailing edge of each wing. Diving ducks do not have this shiny patch.

Some hunters prefer one duck over another for eating. This is because of what the birds eat. Divers eat fish, shellfish, and water plants. Puddlers usually eat grain, seeds, and grasses. The diet of each species affects the flavor of their flesh.

Rare, Protected, or Endangered Species

Some wildlife species are protected from all disturbances because there are not many of them left. These are all nongame species. You are responsible for knowing which local species are on the rare, threatened, or endangered lists.

These animals are fully protected by laws and statutes that may be local, federal, or both. A species is called threatened if it is likely, in the near future, to become endangered. An endangered species is one that already faces **extinction** in all or a large part of its normal range.

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Large Mammals

Characteristics:

- Fur or hair covered
- Warmblooded
- Breathes with lungs
- Feet are hoofed or have a pad with toes
- Females bear live young
- Young are fed from mammary glands
- Females look similar, but are usually smaller than males

Key to symbols: F = front foot H = hind foot

 = double impression of track as it appears in the field.

white-tailed deer

Size: length to 6 ft. (1.8 m); shoulder height to 3¾ ft. (1.1 m); male weight 75-400 lb. (34-181.4 kg); female weight 50-250 lb. (22.7-113.4 kg).

Habitat: brushy, low mixed woodlands, and forest edges.

mule deer

Size: length to 6½ feet (2 m); shoulder height 3-3½ feet (.9-1.1 m); male weight 125-400 lb. (61.2-181.4 kg); female weight 100-150 lb. (45.4-68 kg).

Habitat: forests, desert shrubs, plateaus, brushy areas, and rock uplands.

elk

Size: length of bull to 9½ ft. (2.9 m); shoulder height 4-5 ft. 1.2-1.5 m); male weight 700-1,100 lb. (349.3-499 kg); female weight 500-650 lb. (226.8-294.8 kg).

Habitat: semi-open woodlands, mountain meadows in summer, foothills, plains, and valleys.

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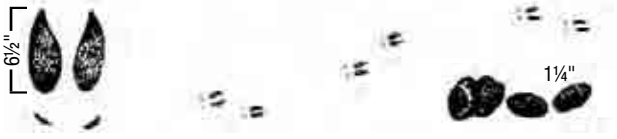
moose

Size: length to 10 ft. (3 m); shoulder height to 7½ ft. (2.3 m); male weight to 1,400 lb. (635 kg); female weight 600-800 lb. (272.1-362.9 kg).

Habitat: wilderness forests near shallow lakes, marshes, and swamps.



timber wolf

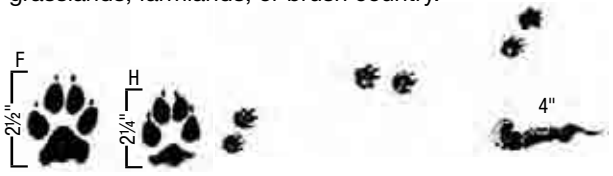
Size: head and body 51-71 in. (130-180 cm); tail 17-18 in. (43-45 cm); weight 67-110 lb. (30-50 kg).

Habitat: wilderness areas only, plains, forests, and tundras.

coyote

Size: head and body 46-49 in. (118-125 cm); tail 13-15 in. (33-38 cm); weight 24-31 lb. (11-14 kg).

Habitat: prefers open spaces such as grasslands, farmlands, or brush country.



mountain lion/cougar

Size: head and body 42-54 in. (106.7-137.2 cm); tail 30-36 in. (76.2-91.4 cm); shoulder height 26-31 in. (66-78.7 cm); weight 80-260 lb. (36.3-117.9 kg).

Habitat: forests, remote mountains, plains, and swamps.

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black bear

Size: length 5-6 ft. (1.5-1.8 m); shoulder height 2-3 ft. (.6-.9 m); weight 200-400 lb. (90.7-181.4 kg).

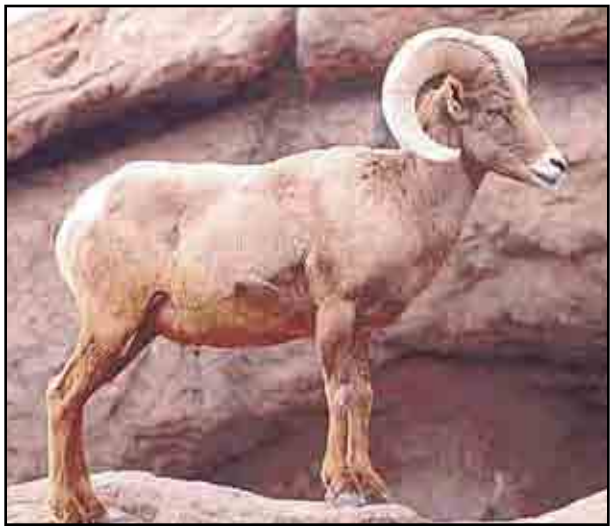
Habitat: forests, swamps, mountains.

grizzly bear / brown bear

Size: length 6-7 ft. (1.8-2.1 m); shoulder height 3-3½ ft. (.9-1.1 m); weight 325-850 lb. (147.4-385.6 kg).

Habitat: forested areas of oak and beech trees, remote country and mountains.

big horn sheep



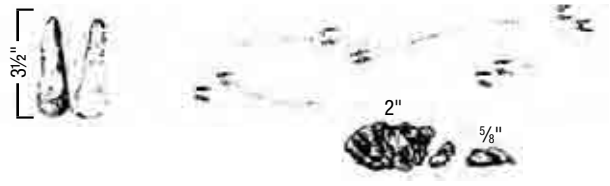
Size: shoulder height 2½-3½ ft. (.8-1.1 m); male weight 125-275 lb. (56.7-124.7 kg); female weight 75-150 lb. (34-68 kg).

Habitat: rugged mountain slopes in high country, with sparse timber and bushy plants.

mountain goat

Size: head and body to 5 ft. (1.5 m); shoulder height 3⅓ ft. (1.1 m); weight to 276 lb. (125.2 kg).

Habitat: mountain tops above tree line in summer, lower elevations in winter.



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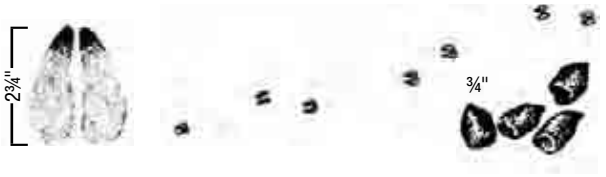
pronghorn

Size: length to 4½ ft. (1.4 m); shoulder height to 3½ ft. (1.1 m); weight 75-140 lb. (34-63.5 kg).

Habitat: plains, open prairie, sagebrush flats, desert.

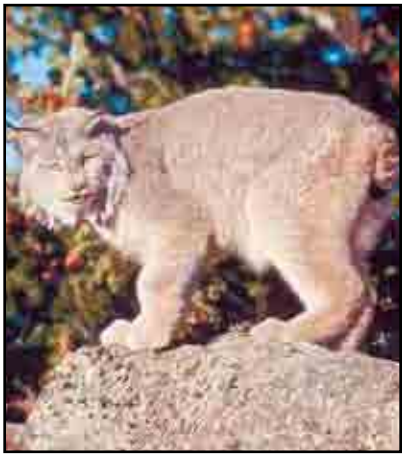


Small Mammals

Characteristics:

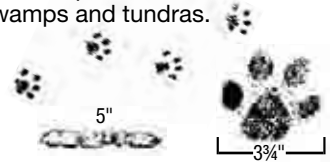
- Body is fur or hair covered
- Warmblooded
- Breathes with lungs
- Feet are hoofed or have a pad with toes
- Females bear live young
- Most are nocturnal and secretive
- Many live underground, or in trees and brush
- Young are fed from mammary glands
- Male and female are usually identical

lynx



Size: head and body 32-40 in. (81.3-101.6 cm); tail to 4 in. (10.2 cm); shoulder height 20-29½ in. (50.8-75 cm); weight 15-30 lb. (6.8-13.6 kg).

Habitat: prefers forest areas, swamps and tundras.



bobcat

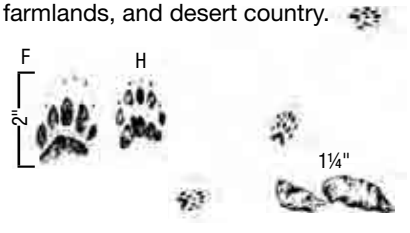
Size: head and body 25-30 in. (63.5-76.2 cm); tail to 5 in. (12.7 cm); shoulder height 20-23½ in. (50.8-60 cm); weight 15-35 lb. (6.8-15.9 kg).

Habitat: forests, swamps, deserts, mountains, scrub and wild country.

badger

Size: head and body 18-22 in. (45.7-55.9 cm); tail 7-12 in. (17.8-30.5 cm); weight 13-25 lb. (5.9-11.3 kg).

Habitat: dry, open prairie, farmlands, and desert country.



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raccoon

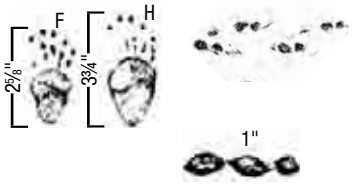
Size: head and body 24-37½ in. (61-95.3 cm); tail 7½ -16 in. (19.2-40.6 cm); weight 12-48 lb. (5.4-21.8 kg).

Habitat: streams, rivers, lakes, woods, and swamps.

porcupine

Size: head and body 18-22 in. (45.7-55.9 cm); tail 7-9 in. (17.8-22.9 cm); weight 10-30 lb. (4.5-13.6 kg).

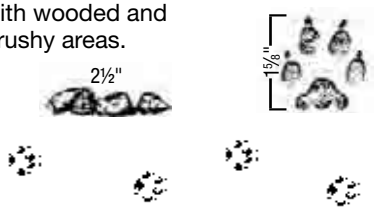
Habitat: forest and stream areas, prairie where trees are present.



gray fox

Size: head and body 21-44 in. (53.3-111.8 cm); tail 11-16 in. (27.9-40.6 cm); shoulder height 11-14 in. (27.9-35.5 cm); weight 7-13 lb. (3.2-5.9 kg).

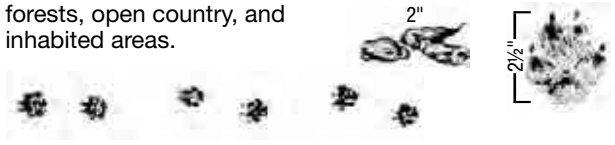
Habitat: usually associated with wooded and brushy areas.



red fox

Size: head and body 22-42 in. (55.9-106.7 cm); tail 14-16 in. (35.5-40.6 cm); shoulder height 14-16 in. (35.5-40.6 cm); weight 8-15 lb. (3.6-6.8 kg).

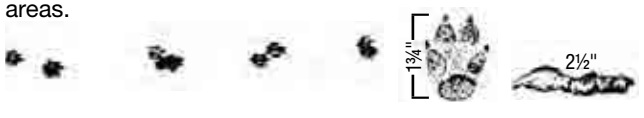
Habitat: areas combining forests, open country, and inhabited areas.



kit fox/swift fox

Size: head and body 15-31 in. (38.1-78.7 cm); tail 9-12 in. (22.9-30.5 cm); shoulder height 10-12 in. (25.4-30.5 cm); weight 4-6 lb. (1.8-2.7 kg).

Habitat: deserts, prairies, dry foothills, and other arid areas.



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red squirrel

Size: head and body 7-8 in. (17.8-20.3 cm); tail 4-6 in. (10.2-15.2 cm); weight 5-8⅞ oz. (142-252 g).

Habitat: coniferous forests, mixed forest; often found around structures.

fox squirrel

Size: head and body 17⅞-27½ in. (45.4-69.8 cm); tail 7⅞-13 in. (20-33 cm); weight 17⅝ -37⅛ oz. (504-1,062 g).

Habitat: hardwood forests, borders of cypress swamps, thickets, and urban areas; prefers large trees.

yellow-bellied marmot

Size: head and body 14-19 in. (35.6-48.2 cm); tail 4½-9 in. (11.4-22.9 cm); weight 5-10 lb. (2.3-4.5 kg).

Habitat: dry woods, pastures, meadows, and bushy ravines.

prairie dog

Size: head and body 11-13 in. (27.9-33 cm); tail to 4 in. (10.2 cm)–tail averages ⅕ of total length; weight 2-3 lb. (.9-1.4 kg).

Habitat: short-grass prairies.

striped skunk

Size: head and body to 18 in. (45.7 cm); tail to 10 in. (25.4 cm); weight to 10 lbs. (4.5 kg).

Habitat: nearly all areas, especially woods, plains, and meadows.

spotted skunk

Size: head and body 9-13½ in. (22.9-34.3 cm); tail 4½-9 in. (11.4-22.9 cm); weight 1-2 lb. (.5-.9 kg).

Habitat: may be found in all areas, especially in brushy regions, forest edges, and rocky outcrops.

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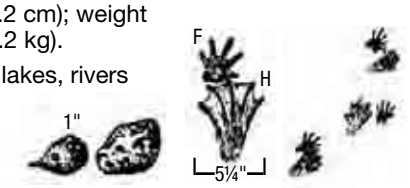
beaver

Size: head and body 25-30 in. (63.5-76.2 cm); tail 11-17 in. (27.9-43.2 cm); weight 30-60 lb. (13.6-27.2 kg).

Habitat: streams, lakes, rivers and marshes.



muskrat

Size: head and body 10-14 in. (25.4-35.6 cm); tail 8-11 in. (20.3-27.9 cm); weight 2-4 lb. (.9-1.8 kg).

Habitat: fresh, brackish or saltwater marshes; also lakes.

white-tailed jackrabbit

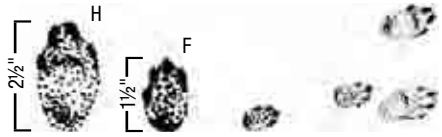
Size: head and body 18-22 in. (45.7-55.9 cm); ears 4-6 in. (10.2-15.2 cm); weight 5¾ -9½ lb. (2.6-4.3 kg).

Habitat: barren country, exposed mountain slopes, and grasslands.

black-tailed jackrabbit

Size: head and body 17-21 in. (43.2-53.3 cm); ears 6-7 in. (15.2-17.8 cm); weight 4-8 lb. (1.8-3.6 kg).

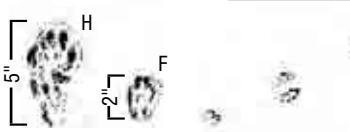
Habitat: widespread in grasslands and open areas, as well as cultivated fields and areas with vegetation over two feet.



snowshoe hare

Size: head and body 13-18 in. (33-45.7 cm); ears 2⅝-3⅛ in. (6.6-7.9 cm); weight 2-4⅛ lb. (.9-1.9 kg).

Habitat: northern and mountainous swamps, woodlands and brushy areas; prefers laurel and rhododendron thickets.



eastern cottontail

Size: head and body 14-17 in. (35.6-43.2 cm); ears 2½ -3 in. (6.4-7.6 cm); weight 2-4 lb. (.9-1.8 kg).

Habitat: from swampy wood to upland thickets, farmlands, forests with open areas nearby, and heavy brush.

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Upland Birds

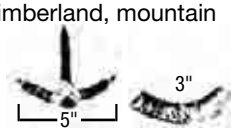
Characteristics:

- Feathers cover body
- Warmblooded
- Young are hatched from eggs
- Many are chicken-like in appearance
- Short, rounded wings and heavy bodies
- Seek cover in brush or woodland areas
- Stay on dry ground
- Female are usually camouflaged by plumage
- Typically do not migrate
- Male is generally colorful to attract a mate
- Plumage often changes with each season

wild turkey

Size: male to 48 in. (121.9 cm); female to 36 in. (91.4 cm).

Habitat: open timberland, mountain forest, logged over land, prairie where food is available.



ring-necked pheasant

Size: male 30-36 in. (76.2-91.4 cm); female 21-25 in. (53.3-63.5 cm).

Habitat: farmland with adjacent growth for cover, mixed woods, and open prairie.

chukar

Size: 13-15½ in. (33-39.4 cm).

Habitat: arid mountains, canyons, brushy slopes, and grasslands.

sharp-tailed grouse

Size: 15-20 in. (38.1-50.8 cm).

Habitat: open brushlands, prairies, clearings, and forest edges.

sage grouse

Size: male 26-30 in. (66-76.2 cm); female 22-23 in. (55.9-58.4 cm).

Habitat: high sagebrush plains and plateaus.

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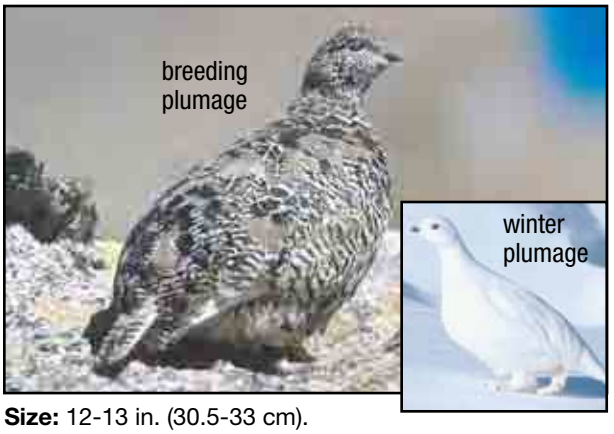
mourning dove

Size: 11-13 in. (27.9-33 cm).

Habitat: dry uplands, grainfields, suburbs, and deserts.

white-tailed ptarmigan



Size: 12-13 in. (30.5-33 cm).

Habitat: tundra, rocky areas above timberline and alpine meadows.

blue grouse

Size: 15-21 in. (38.1-53.3 cm).

Habitat: coniferous forests, logging slash, burned-over timberland, and sub-alpine clearings.

ruffed grouse

Size: 16-19 in. (40.6-48.3 cm).

Habitat: brushy timberlands and coniferous forest edges.

band-tailed pigeon

Photo courtesy Oregon Dept. Fish & Wildlife

Size: 14-15½ in. (35.6-39.4 cm).

Habitat: mountains, coniferous forests, oak woodlands, and canyons.

crow

Size: 17-21 in. (43.1-53.3 cm).

Habitat: fields, coastlines, city parks, river woodlands, and orchards.

Hungarian (gray) partridge

Size: 12-14 in (30.5-35.6 cm).

Habitat: open farmland with weeds for shelter, and grain fields.

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Non-game Raptors

Characteristics:

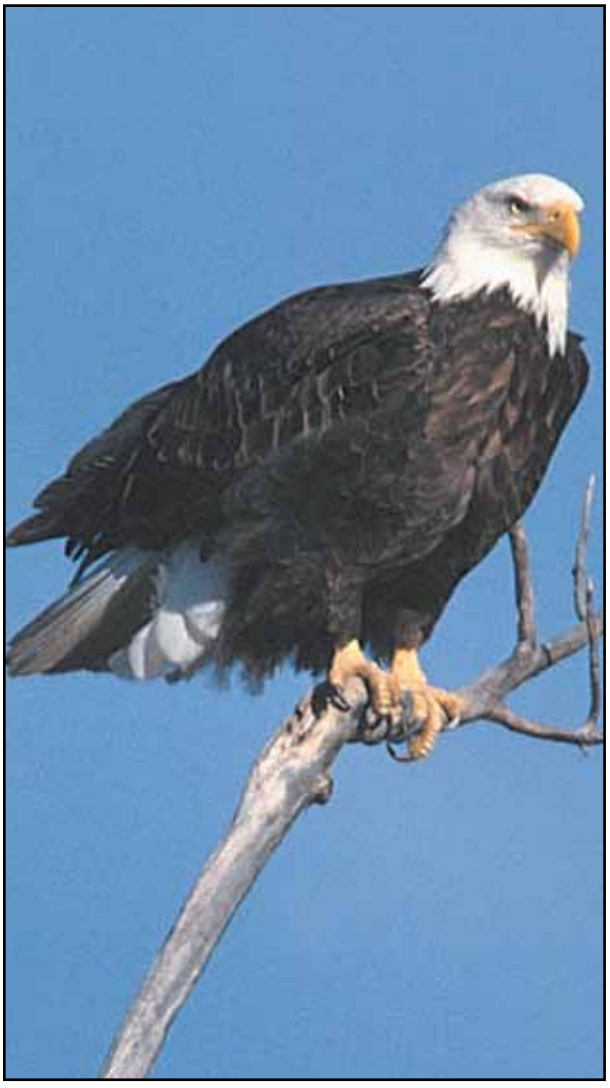
- Feathers cover body
- Warmblooded
- Young are hatched from eggs
- Birds of prey
- Range widely in size
- Male and female usually identical
- Strong legs
- Powerful talons
- Excellent vision
- Excellent flyers
- Often mistaken for other species when immature
- Some are endangered or threatened

golden eagle

Size: 31-40 in (78.7-101.6 cm);
Wingspread 7½ ft. (2.3 m).

Habitat: mountainous and hilly areas of western North America, winters as far as southern Great Plains.

bald eagle



Size: 32-40 in. (81.3-101.6 cm);
wingspread 7½ ft. (2.3 m)

Habitat: associated with large bodies of water, which provide abundant food source, throughout North America.

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red-tailed hawk

Size: 19-25 in. (48.3-63.5 cm); wingspread 4½ ft. (1.9 m)

Habitat: woodlands, fields, plains and deserts.

marsh hawk/ northern harrier

Size: 16-24 in. (40.5-61 cm); wingspread 3½ ft. (1.1 m).

Habitat: marshlands, grasslands and prairies.

American kestrel

Size: 9-12 in. (22.9-30.5 cm); wingspread 2 ft. (.6 m).

Habitat: farmlands, marshes, deserts, forests.

peregrine falcon

Photo courtesy Ohio DNR

Size: 15-21 in. (38.1-53.3 cm); wingspread 3¾ ft. (1.4 m).

Habitat: grasslands and meadows from mountains to the coast.

osprey

Size: 21-24½ in. (53.3-62.2 cm); wingspread 6 ft. (1.8 m).

Habitat: near large bodies of water.

barn owl

Size: 14-20 in. (35.6-50.8 cm).

Habitat: wood edges, farmland, barns, belfries, and water towers.

great horned owl

Size: 18-25 in. (45.7-63.8 cm).

Habitat: throughout North America in various habitats.

short-eared owl

Size: 13-17 in. (33-43.2 cm).

Habitat: open country throughout North America.

screech owl

Size: 7-10 in (17.8-25.4 cm).

Habitat: orchards, woods, suburbs and small towns.

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Ducks at a Distance

Identification is Important

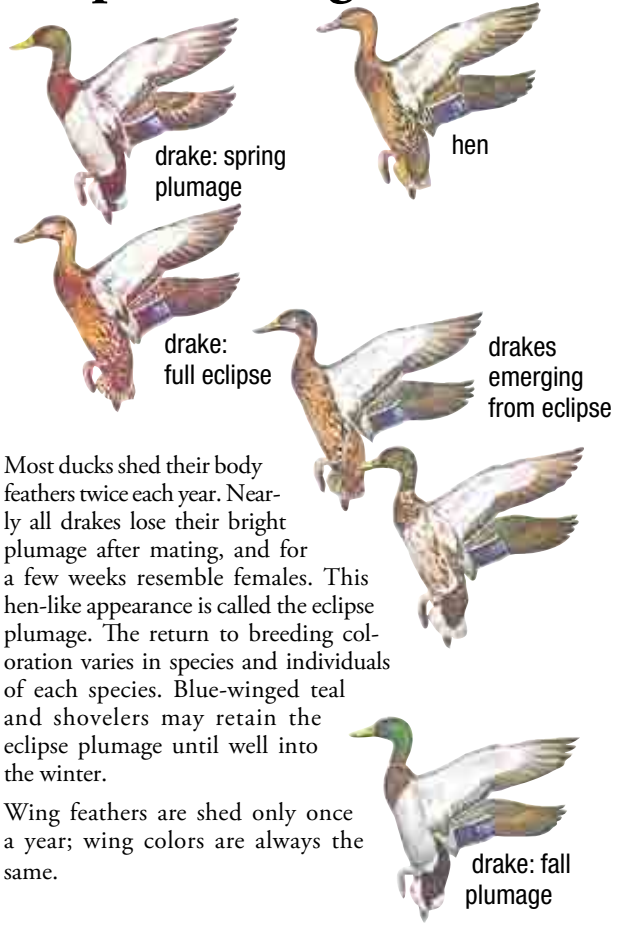
Identifying waterfowl give many hours of enjoyment to millions of people. This guide will help you recognize birds on the wing—it emphasizes their fall and winter plumage patterns as well as size, shape and flight characteristics. It does not include local names.

Recognizing the species of ducks and geese can be rewarding to birdwatchers and hunters—and the ducks.

Hunters can contribute to their own sport by not firing at those species that are either protected or scarce, and needed as breeders to restore the flocks. It can add to their daily limit; when extra birds of certain species can be taken legally, hunters who know their ducks on the wing come out ahead.

Knowing a mallard from a merganser has another side: gourmets prefer a corn-fed mallard to the fish duck.

Eclipse Plumage



Most ducks shed their body feathers twice each year. Nearly all drakes lose their bright plumage after mating, and for a few weeks resemble females. This hen-like appearance is called the eclipse plumage. The return to breeding coloration varies in species and individuals of each species. Blue-winged teal and shovelers may retain the eclipse plumage until well into the winter.

Wing feathers are shed only once a year; wing colors are always the same.

What to Look For

Differences in size, shape, plumage patterns and colors, wing beat, flocking behavior, voice and habitat—all help to distinguish one species from another.

Flock maneuvers in the air are clues. Mallards, pintails and wigeon form loose groups; teal and shovelers flash by in small, compact bunches; at a distance, canvasbacks shift from waving lines to temporary Vs.

Closer up, individual silhouettes are important. Variations of head shapes and sizes, lengths of wings and tails, and fat bodies or slim can be seen.

Within shotgun range, color areas can be important. Light conditions might make them look different, but their size and location are positive keys. The sound of their wings can help as much as their calls. Flying goldeneyes make a whistling sound; wood ducks move with a swish; canvasbacks make a steady rushing sound. Not all ducks quack; many whistle, squeal or grunt.

Although not a hard and fast rule, different species tend to use different types of habitat. Puddle ducks like shallow marshes and creeks, while divers prefer larger, deeper and more open waters.

Puddle Ducks

Puddle ducks are typically birds of fresh, shallow marshes and rivers rather than of large lakes and bays. They are good divers, but usually feed by dabbling or tipping rather than by submerging.

The speculum, or colored wing patch, is generally iridescent and bright, and often a telltale field mark.

Any duck feeding in croplands will likely be a puddle duck, for most of this group are surefooted and can walk and run well on land. Their diet is mostly vegetable. Grain-fed mallards or pintails or acorn-fattened wood ducks are highly regarded as food.

Ducks at a Distance, *by Bob Hines, Department of the Interior, U.S. Fish & Wildlife Service, Washington, D.C.*
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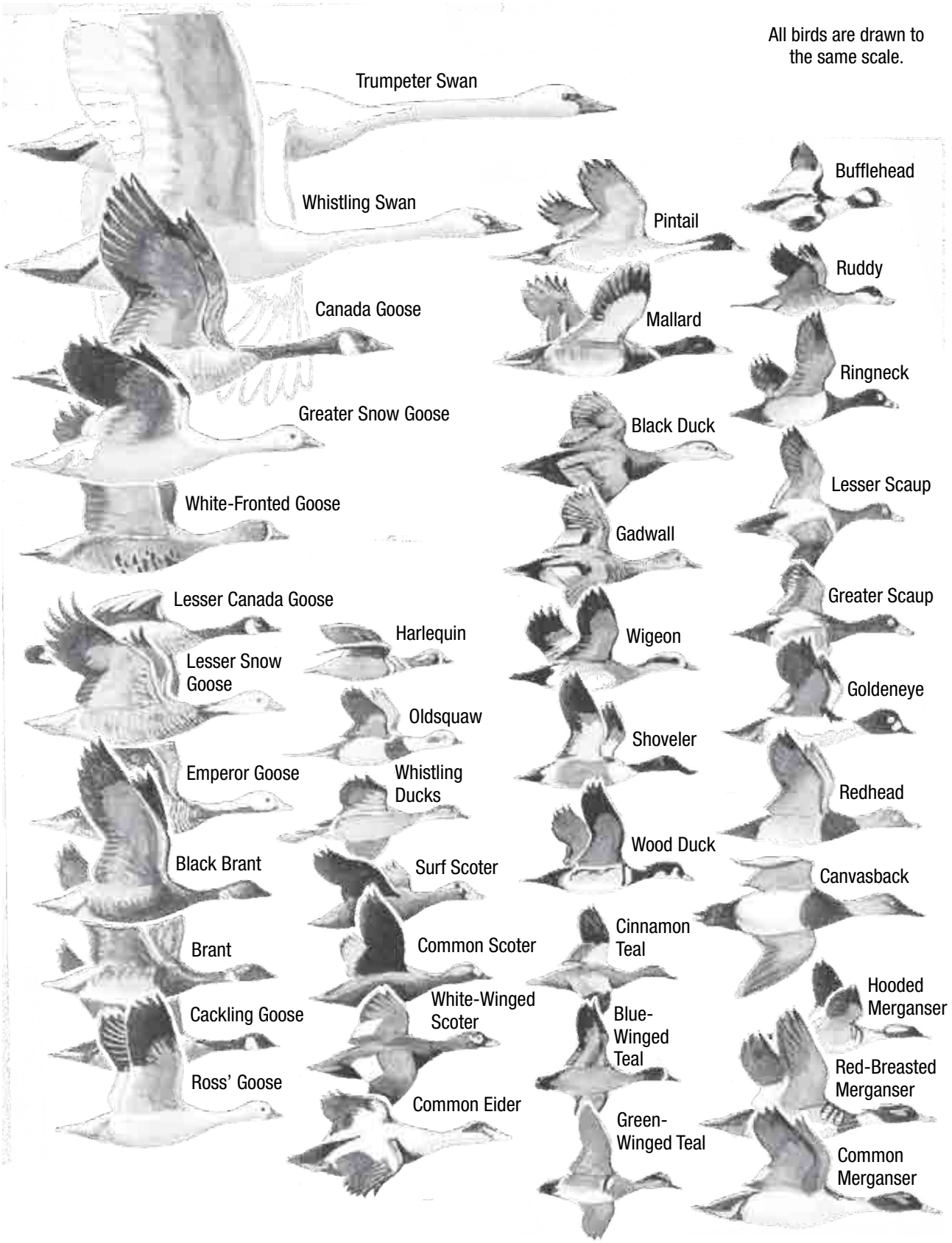
Comparative Sizes of Waterfowl



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6 Marksmanship and Shooting Fundamentals

Marksmanship and Shooting—Key Terms

Dominant/master eye—Eye that gives better information to the brain than the other eye.

Ear protection—Soft, pliable plugs placed in the ear canals, or ear muffs placed over the ears for protection from various types of loud noises, including shooting.

Mounting (a shotgun)—Bringing the stock first to the cheek, and then to the shoulder, when aiming a shotgun.

Shooting glasses—Tinted or clear, high impact lenses worn to protect the eyes while hunting or shooting.

Shooting positions—Four basic body positions used to help hold a rifle steady when shooting. These are prone, sitting, kneeling, and standing.

Sight—Device on a firearm which helps the shooter to aim accurately. Types include open, peep, and telescope.

Sighting-in—Process of adjusting a rifle's sights so that the bullet hits a target area at a given range.

Safe and responsible firearm handling depends on a good understanding of shooting fundamentals. How successful you are in hunting or target shooting depends on marksmanship. Shooting fundamentals teach you what your firearm can do and how it is done. Marksmanship is the skill you develop so that you can place your shots exactly where you want them.

All hunters should have their eyes tested for vision and color-blindness before heading into the field. If corrective glasses are needed for good vision, look for tinted glasses with high impact resistance. These glasses will help you see better, protect your eyes, and prevent eyestrain. They will help you shoot more safely and accurately.

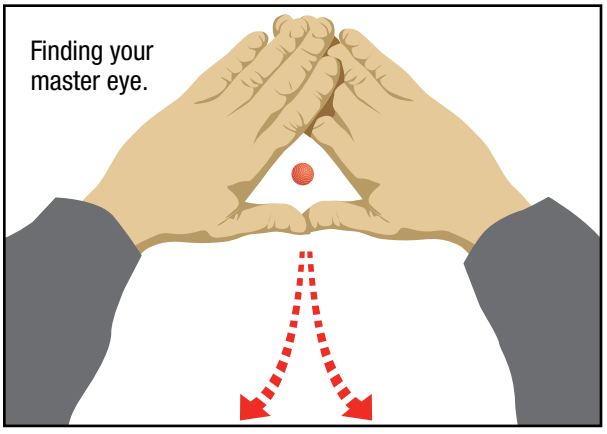
Color-blind hunters (about one out of twelve males) may have trouble identifying game species or their sex. It is hard for color-blind hunters to notice hunter orange quickly. Most people who are colorblind do not even realize it until they are tested.

Master Eye

Almost all shooters have one eye that gives better information to the brain than the other. This is called your *master* or *dominant eye*. A simple test will show you whether your master eye is your left or right eye.

Stand facing a small object about 10 feet (3 meters) away. Keep both eyes open. With your arms extended straight out in front of you, form a small triangle by overlapping your hands. Look through the triangle with both eyes and focus on the object. Bring the triangle toward your eyes, while keeping the object in focus at all times. To keep the object in sight, the triangle will automatically go toward the dominant eye. Which is your dominant eye? Ask your Hunter Education Instructor to check your finding.

It is important to know which is your master eye before you buy or begin to shoot a firearm. If you are right-handed and your right eye is the dominant one, there's no problem. The same is true of a "lefty" with a master left eye. Rifles and shotguns can be bought for right- or left-handed operation. Left-handers having a dominant right eye can learn to use a firearm built for right-handers. If, however, you are right-handed and your master eye is the left one, you may need some help. Talk to a



Finding your master eye.

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competent shooting instructor to find out what you can do to learn to shoot accurately.

Selection of Firearms

Shotguns and rifles have different length stocks. Stocks also have different drop (downward bend). Place the butt of the unloaded firearm in the crook of your elbow. Can your finger comfortably rest on the trigger? Raise the firearm, bringing the stock first to your cheek and then to your shoulder. Do your eyes naturally line up with the sights and target?

A pistol or revolver grip must fit the shooter's hand. With the non-shooting hand, place the unloaded firearm into the "V" between thumb and fingers of the shooting hand. Can you get a firm, comfortable grip high on the butt? Your trigger finger should easily reach the trigger. The size and weight of the handgun must also match the shooter's ability to aim and hold the firearm steady. Also, consider the recoil of larger caliber handguns when selecting one for yourself.

Selection of firearms also depends on which species of game you will pursue. A sportsman does not use a firearm or ammunition too light to harvest game cleanly. Nor does a knowledgeable hunter shoot a game bird or animal with a firearm or load so heavy that the game is not usable when taken. A responsible hunter always has respect for the game he hunts.

A safe hunter should wear *shooting glasses* whether or not he needs them for good vision. High impact lenses protect eyes in case of an accident. The glasses guard your eyes from twigs and branches. Tinted lenses keep your eyes from being fatigued or bothered by the sun. Polarized glasses help you see better in glaring light. Use yellow lenses for dim light.

A good way to prevent eyes from becoming tired is to move them slowly from one side to the other while hunting. This allows you to see more game and locate other hunters, and prevents *tunnel vision* (when you look only straight ahead of you). It is not safe to let this happen if you are hunting in a group.

Shooters should wear *ear protection* at practice ranges. There are earplugs and muffs that work well. Your ears can be damaged by noise of 130 decibels or more. Most firearm noise is at least 130 decibels.

Of course, you would not wear ear plugs or muffs while hunting. Hunters need their hearing to help locate game and keep track of other hunters.

Rifle Marksmanship

Rifle shooters use four positions to hold rifles steady. These are *prone, sitting, kneeling,* and *standing.* The steadiest position is the prone position. The least steady is the standing position. See the drawings shown here for the proper way to get into and use these positions.

Knowledgeable hunters will fire from a rest whenever they can. This can be a log, rock, or stump. They use a hat, coat, or their hand between the rifle and any hard objects. That way, the rifle barrel will not bounce up slightly when fired, causing a missed shot.

Study the drawings of rifle sights shown on the next page. *Telescope sights* are designed so that a bullet will hit at the crosshair aiming spot. *Open* or *peep sights* should be lined up so that the front and rear sights are level. The blade, bead, or post of the front sight is centered in the

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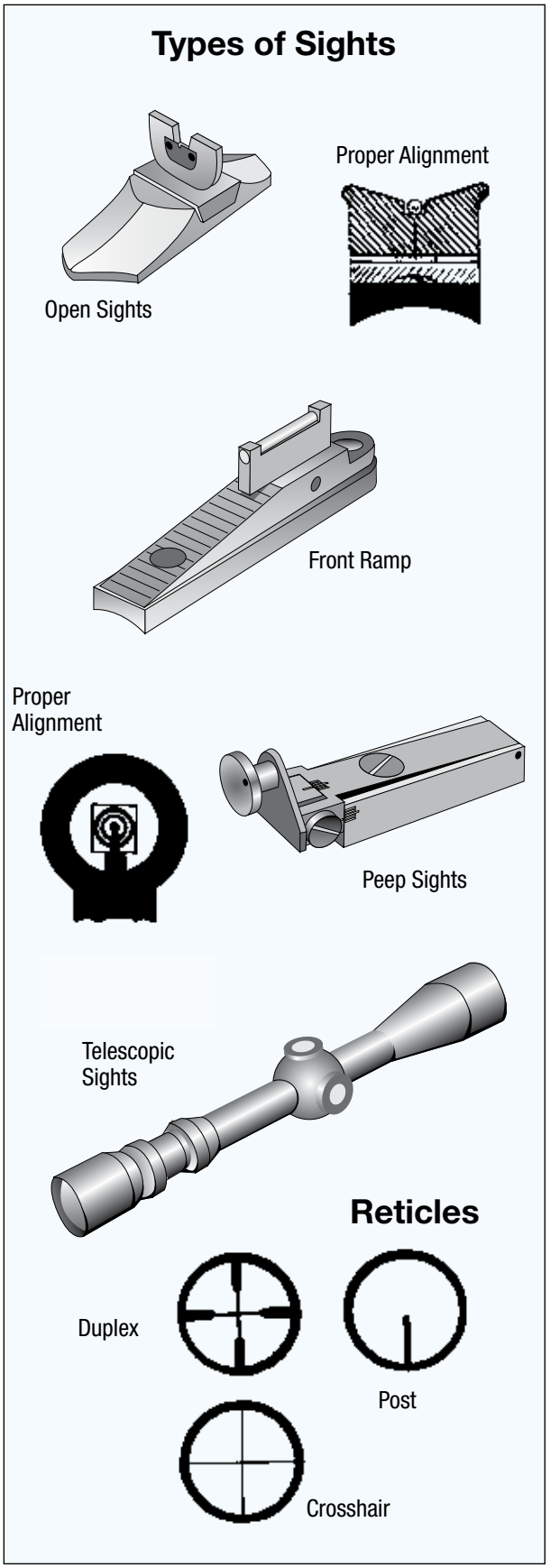
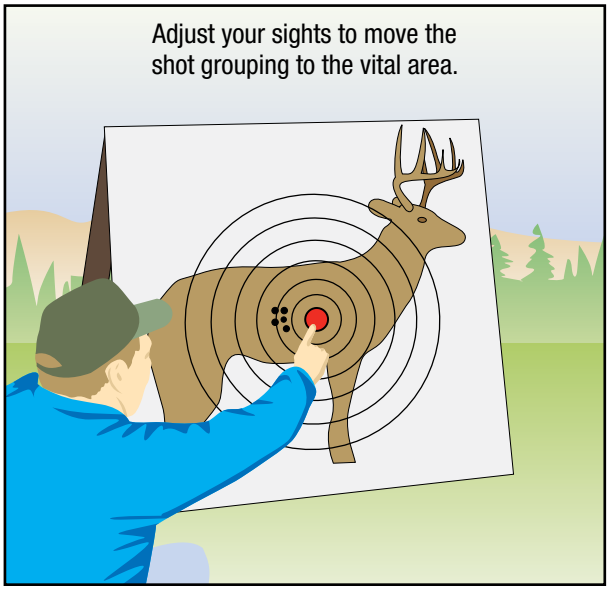


rear sight. The spot you want your bullet to hit should sit on the front sight like a spinning basketball on a fingertip. It's called the "six o'clock" sight picture. If the target were a clock, your front sight would be at six o'clock.

Take a breath when you have a good aim on your target. Relax your muscles, letting your bones, not your muscles, support the firearm. Let out half of your breath before squeezing the trigger with gentle, steady pressure. Hold your sight picture after the shot. If you jerk the trigger, you probably will miss the bull's-eye. If you hold your breath too long (more than three to eight seconds), your rifle will move as your heart beats faster. If this happens—stop. Ease off on the trigger and start over. As you are squeezing the trigger, your aim may wander a bit from your target. Stop squeezing until the target and sights are back in **alignment.** Hold your aim steady after the shot, so the rifle's recoil doesn't cause a miss.

Sight in your rifle before hunting or if you think the rear sight or scope may have been bumped out of alignment. Do this at a rifle range or with a safe, dirt bank background. Remember to move the rear sight in the same direction that you want the bullet to go.



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Aim a rifle. Squeeze the trigger.

Point a shotgun. Pull the trigger.

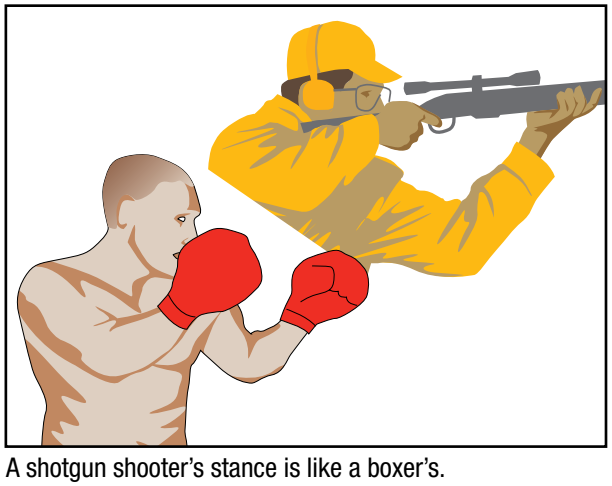
Shotgun Marksmanship

When hunting birds or small game, a shotgun hunter does not aim at a target, he points at it with the barrel. This makes shotgun hunting different from rifle hunting.

Your shooting position is much like a boxer's stance. Your feet are spread apart, your weight is balanced, and your arms and upper body are free to swing to the left or right.

When a game bird flies, or a rabbit runs, face toward the game and take this stance. Next, bring the shotgun up to your cheek, then settle it against your shoulder. This is called *mounting* the shotgun. Keep both eyes open, looking at the game while your barrel swings to track it. Practice this to make your movements as smooth and coordinated as you can.

A shotgun trigger is pulled with the finger, not squeezed like a rifle. This is done firmly, not with a jerky movement, and is often referred to as "slapping" the trigger.

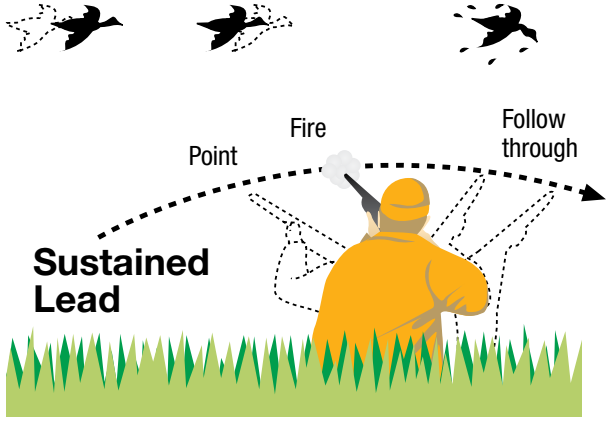


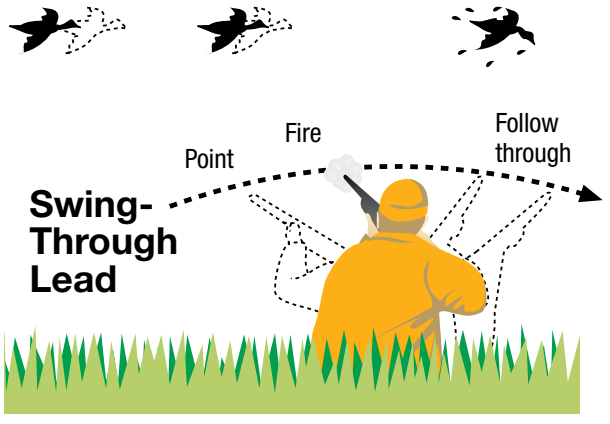
A shotgun shooter's stance is like a boxer's.

Before you shoot, shift your weight more to the leg out in front (left leg for right-handers, and right for left-handers), and lean slightly into the shotgun. When your barrel points where you want it to, pull the trigger.

Moving game requires you to lead, or shoot ahead, of the target. After the shot, you must follow through with the swing of your firearm barrel. Some hunters call this "*painting*" the game.

There are two commonly used ways of leading. One is the *swing-through* method. A hunter will follow the





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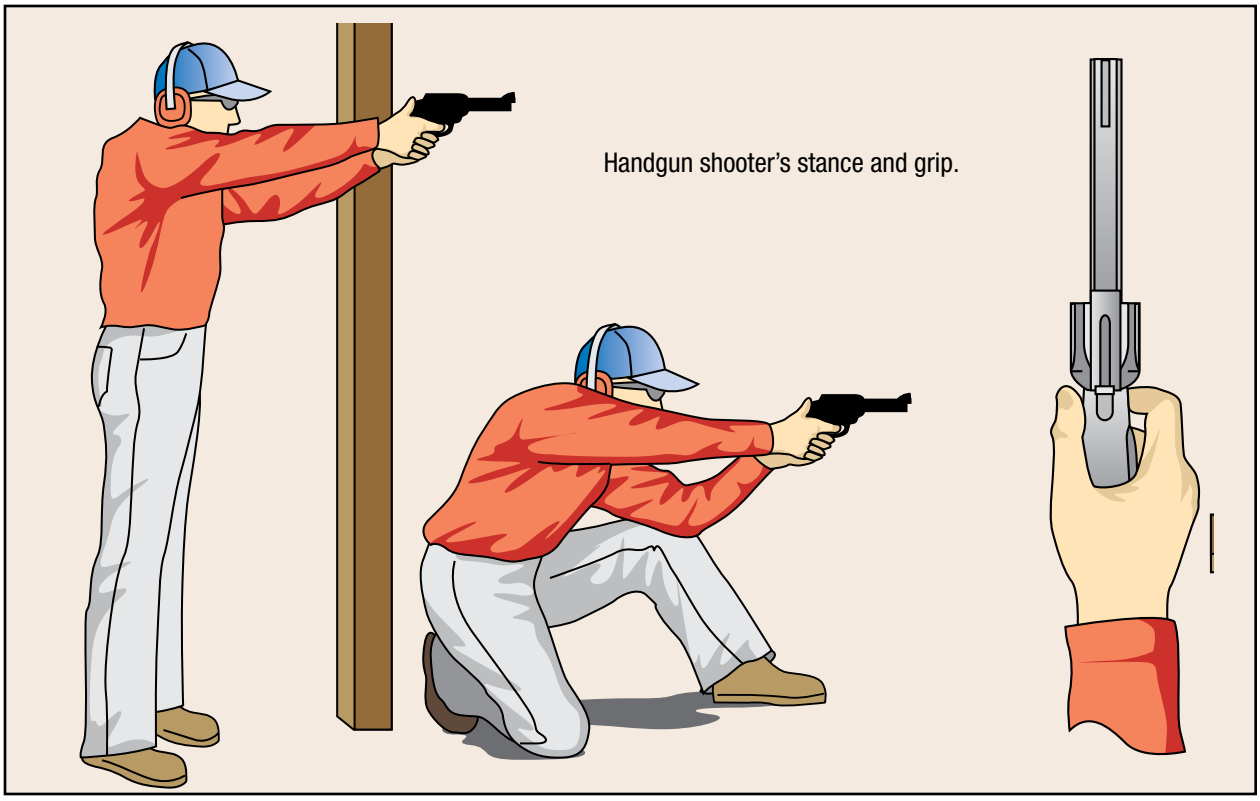

Handgun shooter's stance and grip.

flight path of the game until his firearm muzzle passes it, then pull the trigger. How far past the target depends on how far away the target is and how fast it is moving. Proper lead requires judgment gained through hunting experience and practice shooting with clay birds. It is important to continue your swing after the shot so that you will not shoot behind your target.

Sustained lead is the second method of swinging on game. You point your shotgun ahead of the game, then swing. The key to this method is to swing the barrel at the same speed, on the flight line, of the target. Then, when you fire, your target runs into the shot pattern. Again, keep swinging after the shot.

Handgun Marksmanship

Pistol and revolver sights are very much like the open sights on rifles. The same sight picture is used.

When used for hunting, handguns are gripped with both hands for firing. Pressure in the grip should be front to rear. The butt of the handgun should be held firmly, but not squeezed. One good way to keep your aim steady is to push with the trigger finger hand and pull with the other, keeping the pressure even. Do not put side pressure on the butt from your fingertips or thumbs.

When your sights are aligned on the target, the trigger is pulled steadily and gently straight back.

Handgun hunters should use the most stable positions they can find. A stump, boulder, or a tree branch will give solid support. Putting a cap, hat, or coat between the firearm and a hard support helps maintain aim. The best positions from which to shoot a handgun while hunting are prone, sitting, and kneeling, in that order, if no other rest is available.

When reloading, a responsible hunter will turn sideways toward his shooting hand side. Then the handgun will continue to point in the safe direction he was firing, while it is reloaded.

It is easy to lose muzzle control with a handgun. Safe hunters will always point the muzzle of the firearm in a safe direction. A responsible hunter will never engage in horseplay with a firearm.

It is each hunter's obligation to read and understand his area regulations on hunting with handguns. A safe hunter will use a reliable holster with a safety strap and draw the handgun only when he sees game. Keep your finger out of the trigger guard when removing a handgun from a holster. The handgun is cocked only when the shooter is ready to fire.

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These are some special rules of safety that apply to handguns.

1. When practicing, you should always wear hearing protection because the muzzle blast is so loud and close to the shooter's head. Bystanders, too, should put their fingers in their ears if they do not have hearing protection equipment with them.
2. Eye protection is essential. A burst shell, punctured primer, or lead spitting from a poorly aligned cylinder or barrel can cause damage to your eyes.
3. When firing a revolver, do not place your hand or any other part of your body in front of the cylinder. Burns will result.
4. When "quiet cocking" an outside hammer handgun, place your thumb between the hammer and frame to prevent accidental discharge.
5. Use only long eye relief special handgun scopes on handguns.
6. Carry, transport, and hunt using revolvers with the hammer resting on an empty chamber of the cylinder. The hammer should be let down all the way, not a quarter cock, load cock, half cock, or full cock.
7. Always keep the muzzle pointed in a safe direction. The short barrel is easily moved without notice by the holder.

Summary

Every shooter is responsible for safety. It's not someone else's job, it's yours.

Hunters should learn shooting fundamentals and marksmanship in order to make safe, one-shot, clean kills.

Responsible shooters will obey all regulations. They always shoot safely. Responsible hunters never shoot at a whole target. They aim for one spot.

It is important to practice shooting to gain the skills needed for safe hunting. You must give your brain enough facts to allow it to make responsible choices.

Shooting sports can be enjoyed for a lifetime. The more you learn and the more skill you gain, the safer and more enjoyable your sport will be.

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MARKSMANSHIP—Review

1. What does the term "master eye" mean and why is this important?

_____

_____

2. Name what you can use for eye and ear protection and state when you should use them.

_____

_____

3. What are three types of sights found on rifles?

_____ _____ _____

4. What are four positions used to hold rifles steady?

_____

_____

_____

_____

5. Describe the shooter's stance when using a shotgun.

_____

_____

6. What do the following terms mean:

"Mounting" a shotgun _____

"Leading" a target _____

7. Describe how a handgun should be held for firing.

_____

_____

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7 Basic Hunting Techniques

Hunting Techniques—Key Terms

Blind—A natural or artificial structure designed to hide the hunter from the game animal.

Camouflage—Disguise, usually one which makes a person blend in with the background.

Game calls—A mechanical device or voice technique that attracts a game animal toward the hunter.

H-E-L-P—Heat Escape Lessening Posture. Position used by a lone person in the water to increase survival time.

PFD—Personal Flotation Device. Piece of lifesaving equipment worn in water-related sports.

Stalking—Slow, cautious movement of a hunter after game has been spotted or very fresh signs of game have been seen.

Still Hunting—Hunting method involving stealthy, silent movement through game habitat with frequent stops to watch and listen for game.

Tree stand—Platform mounted in a tree on which a hunter waits for game to come within range.

Preparing for the Hunt

One of the first things to do when planning a hunting trip has to be making sure you have a hunting license. Depending on the type of animal or particular area you plan to hunt, the licenses may be in limited number or selected by lottery well before the start of the season. The dates of license sales or drawings can be obtained from license selling agents or regional Game and Fish offices. Along with the license, always get a copy of the state's hunting regulations for the species and area. Study it to be sure you understand the seasons, bag limits, and any new rules or changes that may be present. You are responsible to know the laws and regulation—not knowing a law is not an acceptable excuse for breaking it.

Next, determine whether you will be hunting on private or public land. If it will be on private land, plan ahead to contact the landowner or manager to obtain permission and find out if they have any restrictions on where or when you can hunt. If it is public land, find out which government agency manages the area (e.g. Forest Service, Park Service, BLM, etc.), find out if hunting is permitted, and see if there are any restrictions or special regulations that apply to that area.

Be sure to educate yourself on the physical appearance and habits of the animal you will be hunting, especially if there are restrictions on the type or sex that can be harvested. For instance, in areas where both mule deer and whitetails are present, only one species may be legal at this time, or 'bucks only' for one species and 'any deer' for the other. Similar restrictions are often seen with waterfowl and other game animals.

If you will be traveling with hunting dogs or pack animals, plan ahead to obtain any permits, health certificates, vaccination records, or brand inspections that may be needed. You may also need to obtain hay that is certified weed free before entry into many areas.

Prior to heading out on the hunt, spend some time at the shooting range sighting in your rifle or bow, or patterning your shotgun. This is also a good time to spend more time sharpening your own shooting skills and confidence.

Preseason planning.

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Getting a regulations book with a license.

Hunt preparation should always include physical preparation. Be sure you are physically fit for the type of hunting planned by walking and/or doing conditioning exercises early and often enough to gain some benefit. Now would also be a good time to get your vision checked and a physical exam to further ensure an enjoyable hunt.

Developing lists of equipment to take along is very helpful. It is very easy to forget important items while packing for the hunt. A thorough checklist will help prevent arriving at the campsite without your sleeping bag, license, or even your gun or ammunition. Breaking the list into categories often helps, with one list for hunting equipment, another for camping equipment and personal supplies, and another for survival and first-aid supplies.

One of the most important preparations for hunting is the formulation of a hunting plan. This plan can contain as much information as you desire, but at a minimum should always include:

Where you are going—Either describe the area precisely or highlight it on a handmade or printed map.

Who is going with you—List their names and any contact information, such as phone numbers, addresses, and who to contact, if necessary.

When you plan to return—Be as specific as possible. Allow for possible minor delays, but set a time frame when friends or family should consider you overdue and take appropriate action.

The hunting plan can also list routes of travel, vehicle descriptions and license numbers, and other special information. Be sure to include enough information that you, or any member of your hunting party, can be contacted in case of an emergency at home, or if you are injured or incapacitated while hunting, rescuers will know where to begin looking. Leave a copy of this plan with one, or preferably two responsible adults.

Hunting Strategies

The species of game animal being hunted and the type of habitat and cover present will often suggest the method of hunting that will be the most successful. In some areas more than one technique may be useful and the approach used will depend on the skills, experience, and preferences of the hunter. Beginning hunters will best learn these skills by accompanying more experienced hunters.

Still hunting

This technique involves slow, stealthy, silent movement through the game habitat, with frequent stops to watch and listen for game. The hunter should keep a low profile to disguise the human form, and spend as much, or more, time being still as moving. Take care to walk as silently as possible by watching for dry leaves, twigs, or branches before taking a step. This technique works best in unfamiliar areas, especially in prime game habitat where there is moderate to heavy cover present.

Stalking

Stalking is the slow, cautious movement of a hunter after game has been spotted or very fresh signs of game presence are found, such as tracks in new snow or dew, fresh droppings, and sounds or scents. Special attention must be paid to remaining 'downwind' from the quarry; that

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is, move into the wind toward the animal so the hunter's scent and sounds are carried away from the animal. Use any environmental features available that may aid stalking, such as trees, bushes, rocks, gullies, etc.

Hunting from blinds or stands

A ***blind*** is a natural or artificial structure designed to hide the hunter from the game animal. It may be as simple as a pile of rocks or fallen logs a hunter can get behind. Some blinds may be made by arranging a stack of branches, reeds, cattails, etc., while others may be structures made of wood, tarps, or other man-made materials. A ***stand*** is usually elevated above the normal line of sight of game animals. It is usually in a tree but may be a free-standing elevated structure. The goal of using either a blind or stand is to have the animals approach within shooting range without being aware of the hunter's presence.

If you use an elevated stand, certain safety procedures must be followed. Select a commercial stand that is manufactured, certified, and tested to Treestand Manufacturer's Association (TMA) standards. Homemade stands should not be used. The basic types of tree stands are hang-on stands, climbing stands, and ladder stands. Free-standing elevated stands may be tripods, quadpods, or tower stands.

Always fully inspect your stand before each use. Look for loose bolts and damaged or bent support members. Replace worn chains, straps, or ropes. Never leave a tree stand attached to a tree for more than two weeks. Use removable climbing aids to get to a tree stand.

Climbing Stand

Hunters should always use a properly fitting fall-arrest system (FAS) that includes a full-body harness while climbing a tree, installing a tree stand, and hunting from a tree stand. Select an FAS that has been manufactured to TMA standards. Make sure your FAS includes a full-body harness, a lineman's-style belt and/or climbing belt, a tree strap, a tether, and a suspension relief strap. When you are in any tree stand, including a ladder stand, use the FAS tree strap and tether to attach your FAS full-body harness to the tree. Adjust the tree strap and tether so that you have NO slack while seated in the stand

Ladder Stand

If you should fall while you are in your stand, do not panic – your FAS will hold you. Climb back onto the platform as quickly as possible. If you cannot get onto the platform or the ground, signal for help. To avoid suspension trauma if you must wait for rescue, use the FAS suspension relief strap or keep moving your legs.

Always use a haul line to raise and lower your hunting equipment. Make sure guns are unloaded and arrows are secured in a covered quiver. Raise and lower all hunting equipment on the opposite side of the tree from your climbing route. This could lessen injury if a fall occurs.

Calling game/decoys

Both of these methods use techniques designed to attract the game animals to the hunter. ***Calling*** is effective with many different types of animals and a variety of sounds are imitated to draw the animal in. These may be territorial or challenging sounds (elk bugle, turkey gobble), feeding sounds (ducks, geese), or distress sounds (rabbit squeals to attract coyotes).

Calling game is often more successful when it is combined with the use of decoys. Waterfowl hunters have used ***decoys*** for hundreds of years. They now are becoming more common in other types of hunting, such as turkeys and deer. Special care should be taken when using decoys, especially when also using game calls, to ensure other hunters aren't stalking the decoy thinking it is a real animal. Any time decoys are moved by hand, they should be covered or draped with blaze orange flagging.

Driving game

This hunting method is often used where game is present in areas of dense cover. "Drivers" move through the area to try to move game to other hunters who are positioned where the cover is less dense. This method can be used with small game, upland birds, and deer. All hunters must establish safe zones of fire before beginning to hunt and know where all the other hunters are located. Hunters should always wear hunter orange clothing, move only as decided in the original hunt plan, and never shoot outside their safe zone of fire.

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Photo courtesy Wayne Doyle, KS Wildlife & Parks

Hunting with Dogs

Hunting with well-trained dogs can be a very enjoyable and rewarding time. Their superb sense of smell, keen eyesight, and swimming abilities make them not only useful, but almost essential for some types of hunting. Hunting deer with the aid of dogs is legal (and common) in some states but illegal in Wyoming and many other states.

You are responsible for the training, behavior, conditioning, and welfare of your dogs. Every hunting dog should understand and obey the basic commands of heel, sit, stay, and come, along with the signals needed for that specific type of hunting. Dogs should be given enough exercise during the year to be in good physical condition for the hunt. All regulations regarding licensing, shots, and collar or tag identification must be followed. Food, water, and rest should be provided for both the dog and the hunter during a prolonged hunt.

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Turkey Hunting

Wild turkeys are exciting to hunt. They live in and around forest areas, and are usually hunted by using blinds, camouflage, and various turkey calls. Decoys are often used. Check local hunting laws carefully as special licenses and regulations may apply.

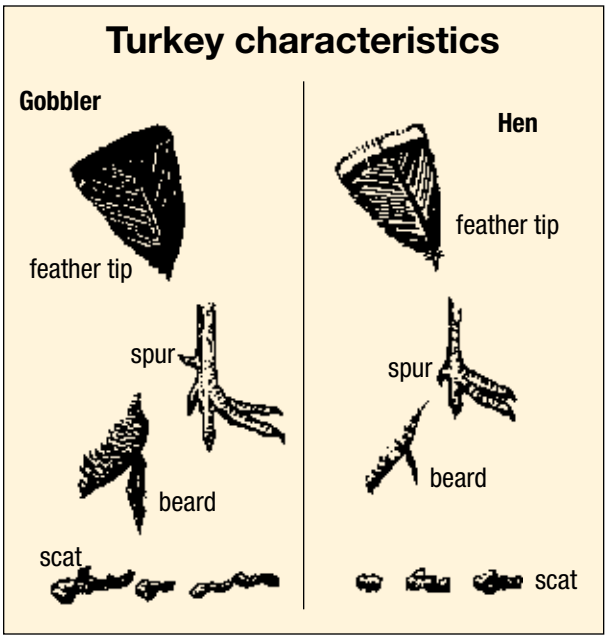
Special Safety Tips

ALWAYS BE ABSOLUTELY SURE OF YOUR TARGET. Shoot only when you can see the entire bird. Most turkey hunting accidents occur when someone mistakes another hunter for a turkey. Never shoot at any sound, including turkey calls, or movements. Never shoot at a "part or piece" of a turkey. Remember that your aiming point should be the head and neck.

NEVER WEAR OR USE ANYTHING THAT IS RED, WHITE, BLUE, OR BLACK. These are the same colors that are seen on the head of a male turkey. If you wear them, you are increasing your chance of being mistaken for a turkey.

ALWAYS PLAN AND DISCUSS YOUR HUNT WITH YOUR HUNTING COMPANIONS. Safety should always be discussed by hunting partners. Remember to plan your hunt and stick to the plan. Be sure that you know where your partners will be hunting. Remember that many accidents have occurred when plans were not followed. Choose your hunting partners carefully, only hunt with people who are safety conscious and who will follow the plans that are made.

ALWAYS SET UP TO CALL IN A FAIRLY OPEN AREA. It is important to be able to see clearly in all directions for at least 50 yards, in order to protect yourself from someone who might stalk your calling sounds. Always sit with your back against a tree or other solid object at least as wide as your shoulders and as tall as your head.



DO NOT MOVE IF YOU SEE ANOTHER HUNTER. Remain perfectly still, and speak to the hunter in a normal voice, or call out in a loud voice to someone farther away. Never wave, use a turkey call, or stand up. Do not move until you are absolutely sure that the hunter knows that you are there.

WEAR BLAZE ORANGE WHEN ENTERING OR LEAVING THE TURKEY WOODS. Once you are set up to call, you can conceal your blaze orange clothing in a camouflage bag. Placing an article of orange clothing as high as possible on your blind will usually not disturb turkeys, but will be noticeable by other hunters.

NEVER CARRY A DECOY OR A TURKEY UNLESS IT IS TOTALLY CONCEALED OR WRAPPED IN BLAZE ORANGE MATERIAL. If you are carrying a turkey or something that looks like a turkey, you greatly increase your chance of being mistaken for game.

REMEMBER THAT YOU ALONE ARE RESPONSIBLE FOR YOUR ACTIONS. Once you decide to pull the trigger, there is no calling back the shot. Always be positive of your target, and be careful not to appear to be a target for other hunters. Turkey hunting is one of the most exciting of all hunting activities, and mistakes are often made when people are excited.

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Hunting on or around water

Boats are most commonly used for waterfowl hunting, but are also used to reach big game hunting areas. Hunting seasons are usually in the late fall or early winter when air and water temperatures are low. In addition to all the rules of firearm safety, hunting on or around water adds two other major dangers. These are *drowning* and *hypothermia*. Hypothermia is a dangerous, possibly fatal lowering of body temperature and is discussed in the chapter on Outdoor Survival.

Every person in any boat should have a *personal flotation device* (PFD). Children and nonswimmers should wear their PFD at all times. Float coats, vests, life jackets and seat or boat cushions can save your life. The first three are wearable, while cushions should always be in reach to throw to someone in need. Cushions are used like umpires' chest protectors in the water. Look for the labeled rating on each PFD showing U.S. Coast Guard or proper Canadian authority approval. This label also shows the weight or size person it can be used for. Check your local regulations for required boating equipment.

Causes of water-related accidents

Loading, overloading, or improper balance of boats. Check the carrying capacity printed on your boat's capacity plate. Do not exceed it. People and gear should be loaded low in the boat, with the weight spread so that the boat rides on an even keel.

Alcohol or drugs. Drinking is unsafe, and illegal in most provinces and states, when operating a boat. Alcohol and drugs impair your judgment and slow your reaction time. Because alcohol lowers body heat, drinking may lead to or deepen hypothermia.

Inexperience or unfamiliarity with equipment. Each person in a boating or hunting group should know how to operate the boat in case of an emergency. Each person must also know how to put on life jackets and should wear them. You should never anchor the boat from the stern. It will make the boat unstable and can swamp the boat. Hunters must closely follow rules of safe firearm handling when shooting from boats.

Standing up in a boat. Any quick movements or large shifts of weight could make you lose your balance and fall in, or even turn the boat over. There is no good reason to stand in a boat for a shot. If you must relieve yourself, do it on shore or use the bailing bucket.

Unsafe firearm handling. It is important to agree on zones of fire and stick to them in a boat. One way might be for the stern (rear) shooter to face toward the rear, and take only shots behind the boat and to his left. The bow (front) shooter faces toward the front, and fires only in front of the boat and to his left. Each hunter should tell the other when he is going to fire. Duck hunters using canoes should plan to shoot only from the front seat, with the paddler swinging the canoe so that the shot will be to the front.

Misuse or nonuse of personal flotation devices (PFDs). Wear your PFD at all times, and make sure it is buckled, zipped, or snapped. Do not stow PFDs out of the way in the front of the boat or under the seats. In an emergency you might not be able to reach them. Ninety percent of the people who die in boating accidents did not use a PFD.

Unsecured or improperly secured equipment. Make sure that all cargo and equipment is lashed down or stowed to prevent shifting. A change of balance could tip the boat. Leave no small, loose objects on the bottom of the boat that could make you fall. Dogs should be controlled at all times. Firearms should be secured to the boat when not in use.

Proper shooting zones.

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Water survival chart		
If the Water Temp. (°F) is...	**Exhaustion or Unconsciousness Occurs in...**	**Expected Time of Survival is...**
32.5	Under 15 Minutes	Under 15-45 Minutes
32.5-40	15-30 Minutes	30-90 Minutes
40-50	30-60 Minutes	1-3 Hours
50-60	1-2 Hours	1-6 Hours
60-70	2-7 Hours	2-40 Hours
70-80	3-12 Hours	3-Indefinitely
over 80	Indefinitely	Indefinitely

Wading accidents. Extra care must be taken around bodies of water and when crossing streams. Use a wading staff or branch to see how deep the water is, to feel for slippery boulders, and to give you better balance.

Falling through ice. Safe hunters never go out on ice when they do not know its thickness. Four inches may be safe, but you still must watch out for soft ice where springs bubble up or streams enter a large body of water. Ask local authorities about local ice conditions. Crossing snow bridges is risky. Do not go out on the ice to pull another person out of the water if you can reach him with a long branch or piece of clothing. An object, such as a weighted plastic jug, tied onto a strong line, makes a good device to throw for rescue.

Weather. Storms, wind, and heavy rain can cause boating accidents. Be sure to check weather reports before hunting on water. If black clouds roll your way, get to shore. When caught on big bodies of water, waves can roll across the lake, swamping you. If you are caught by bad weather, pull ashore or behind an island out of the wind. Leading into the waves at an angle is a good method of travel in bad weather. Be sure that your boat will not be pulled loose from its anchor or mooring.

Handling Water Emergencies

The first rule in water safety is to *have your PFD on.* Second, *stay with the boat* if you can. Even the best swimmers may not be able to swim a half-mile (804.6 m) to shore and would be chilled in 10 to 15 minutes. Do not take off any clothing, as it helps retain body heat. Wave a red, orange, or yellow cloth, or raise an oar so the sun flashes off it to signal for help. If you have a signal mirror in your survival kit, shine it at other boats, or buildings on shore.

Chest waders will help float you if you bend your knees and raise your feet to trap air inside the waders. Lie back in the water. If you must swim, use the back stroke. Hip boots can help float you, too. Turn on your stomach and bend your knees, so that air cannot get out. If you must swim, dog paddle.

Water survival time increases if a lone person in cold water uses the *HELP* position (Heat Escape Lessening Posture). Keeping arms close to the chest and sides, and legs together and pulled to the chest is the best way to stay warm. If two or more persons are in the water, they should use the *huddle* system. By huddling close together, arms around each other, survival time may go up 50 percent.

Heat Escape Lessening Posture (HELP) position

Huddle system

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HUNTING TECHNIQUES—Review

1. Name three things that should always be included in a hunting plan.

_____

_____

_____

2. What is the difference between “still-hunting” and “stalking”?

_____

_____

3. List four safety procedures that must be followed when using a tree stand.

_____

_____

_____

_____

4. Why should a turkey hunter avoid wearing bright colors, especially red, white, or blue?

_____

_____

5. Name the two major dangers when hunting on or around water.

_____

_____

6. What does “PFD” stand for?

_____

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8 Hunting Skills

Hunting Skills—Key Terms

Muzzle—End of a firearm barrel from which the bullet leaves.

Self-control—The learned ability to remain calm, think clearly, and act correctly during times of excitement or stress.

Skylined animal—An animal that is at or near the top of a hill or ridge.

Tracking—The ability to identify, interpret, and follow signs of an animal's movements; this is especially important if the game has been wounded.

Vital areas—Areas on an animal containing vital organs, especially the heart, lungs, and liver within the ribs of the chest cavity. Vital areas offer the best chance of a quick, clean, rapidly fatal shot.

Zone of fire (safe shooting zone)—Direction or area in which each hunter in a group can safely fire, to be agreed upon before beginning a hunt.

As a beginning hunter, you can learn about hunter responsibilities, laws, regulations, hunting techniques, and other important things by reading, attending hunter education classes, and talking with other hunters. But many of the skills used in hunting, once they have been demonstrated to you, can only be developed and improved by yourself through continuing practice and experience.

Importance of Shooting Proficiency

Shooting proficiency, also called marksmanship, is the ability to consistently hit your desired mark or target. The most obvious reason for the importance of good marksmanship is to be able to hit a game animal once it has been located on the hunt. Even more important is the ability to hit an animal in the most vital areas. An accurate shot will kill quickly, cleanly, and humanely. A good hunter practices marksmanship skills until his shots are consistently accurate, and studies animal anatomy to know where vital organs are located.

Another reason for good marksmanship is safety. If you have the ability to shoot accurately, you will not need to spend time thinking about the techniques of shooting. You can instead concentrate on positively identifying the target animal, where to aim, is there anything in front of, or behind, the target, and determining that the shot is safe.

Shooting Safely

One of the most important elements of safe hunting that must be learned and practiced at all times is self-control. This is especially important with the excitement of pulling the trigger or releasing the bowstring. **No bullet or arrow can be recalled if you decide later not to shoot.** To insure a safe and accurate shot, the entire flight path of the bullet or arrow from release to end should be pictured, and all possible outcomes evaluated. You must be able to see the target animal clearly enough to positively identify it as a legal animal, and be absolutely sure of what is between the hunter and the target, and what is beyond the target.

Shot Placement and Follow-Up

Of all the responsibilities you accept when buying a license and heading afield, none is more critical than taking only responsible shots at game and then recovering the game once it has been hit.

Vital areas

All hunters should show respect for wildlife by striving to make the best, most effective shot possible that ensures a quick death of the animal with minimal pain or suffering. Two skills are needed for the hunter to accomplish this. The first is marksmanship, or the ability to consistently shoot with accuracy. The second is knowing where to place the shot, which involves a knowledge of the game animal's anatomy.

The most effective shots for both bullets and arrows are to the animal's **vital areas.** These are areas that contain vital organs such as the heart, lungs, and liver, and large blood vessels. In mammals these organs are located in

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DON'T SHOOT SITUATIONS

Don't shoot ...

… at a flash of color, sound, movement, or dark shape in the brush or other cover.

… when brush, trees, or other obstacles are between you and your target. You cannot completely identify your target, and the bullet or arrow may be deflected before reaching the target.

… at a skylined animal or one that is near the top of a hill or ridge where a missed shot could pass over the top. Bullets from hunting rifles can travel up to 5-6 miles.

… over a body of water or any hard, flat surface such as rocks or metal, whether it is in front of or behind your target. Any of these can cause a bullet to deflect at an unknown and potentially dangerous angle, or even ricochet back toward you.

… outside your 'zone of fire' or at the same animal as another hunter. Always know the locations of other hunters in your party.

… at a running animal. The chance of making a clean kill is small, and following the animal with the gun may cause it to swing dangerously toward another hunter.

… at an animal that is out of your 'personal effective range' (the distance at which you personally can shoot that particular firearm or bow accurately). Shots taken beyond this range have a greater potential for wounding the animal.

… into a flock or herd in hopes of hitting something. Always aim for a particular target.

… after consuming alcohol or any drugs that affect your coordination or concentration.

the chest cavity just behind the front shoulder inside the rib cage. This is the largest target area and a well-placed shot in this area will be fatal. Since this area also contains many large blood vessels, considerable bleeding will occur if the animal does not die immediately. This will leave a blood trail that is often easy to follow. Bow hunters should limit their shots to this area only.

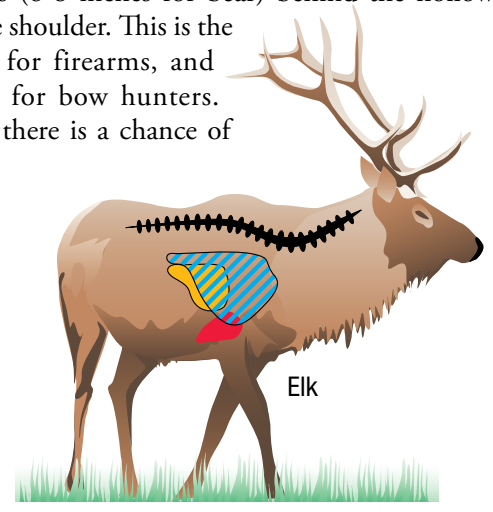
Other vital organ targets for firearms only are the head and neck areas. Although hitting the brain, vertebrae, or spinal cord in these areas will be fatal, the actual target area is very small and this shot is not recommended. Even small errors in shot placement will lead to wounds in the skull, upper or lower jaw, nasal cavity, or throat area. These wounds are not immediately fatal but will lead to the death of the animal over days or weeks due to infection or starvation. Head or neck shots are acceptable when turkey hunting since any head hit is usually fatal, and a head miss tends to miss the bird entirely.

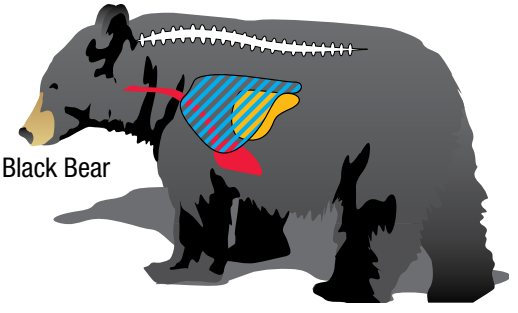
Once you have located game, know the location of the vital areas and have confidence in your ability to shoot accurately, the next skill you need is once again self-control. You must be patient and wait for the animal to turn and present the best target. Once the best opportunity is presented, take one last look at the potential flight path before squeezing the trigger or releasing the arrow.

Target Animal Positions

Broadside

This stance offers the hunter the largest target over the vital area. On large game, the shot should be aimed 2-3 inches (6-8 inches for bear) behind the hollow part of the shoulder. This is the best shot for firearms, and especially for bow hunters. Although there is a chance of





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the arrow hitting a rib, a cutting broadhead will often penetrate both lungs and sever large blood vessels or the heart itself.

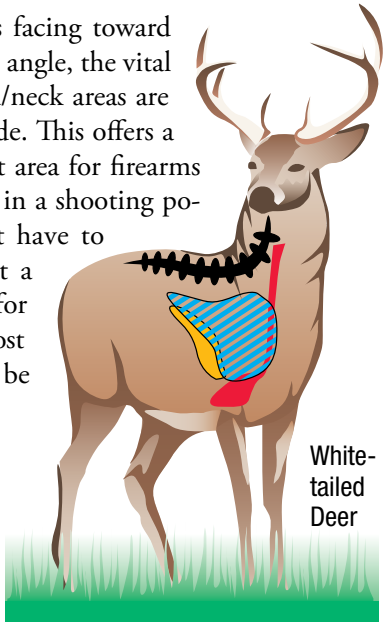
Quartering Away

This stance is when the animal has turned slightly away from the hunter at an angle. Many big game hunters prefer it. Knowledge of the anatomy and the location of the vital organs in relation to other areas is again important. You should aim just behind the rib cage in

the flank area and toward the opposite front leg. The bullet or arrow can penetrate through the soft tissues of the stomach and intestines without hitting any ribs or other bones before entering the vital organs of the chest cavity.

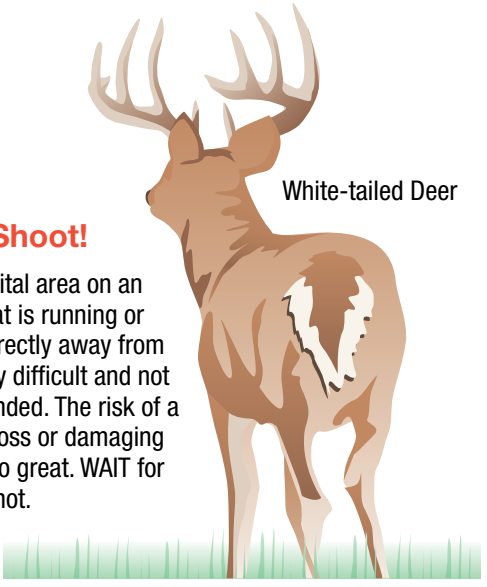
Quartering Forward

When the animal is facing toward the hunter, but at an angle, the vital organs and the head/neck areas are essentially side by side. This offers a relatively large target area for firearms if the gun is already in a shooting position and does not have to be moved. It is not a recommended shot for bow hunters since most of the vital areas will be covered by bone.



Direct Head-On or Straight-Away

Shooting is not recommended when the animal is facing directly at or directly away from the shooter. The target areas are small, the risk of crippling an animals rather than killing it is great, and there is a greater risk of damaging the meat.



Don't Shoot!

Hitting a vital area on an animal that is running or moving directly away from you is very difficult and not recommended. The risk of a crippling loss or damaging meat is too great. WAIT for a better shot.

Tracking and Game Recovery

When hit by an accurately placed bullet, many animals will die instantly or move only a short distance before dropping. Others will bolt, and even a mortally wounded animal can cover a long distance in a short time, often out of sight of the hunter. (A deer may easily travel over 100 yards in just 10—15 seconds.) With bow hunting, many animals will cover even greater distances. The ability and skills needed for tracking will now be necessary to find and recover these animals.

In spite of the urge to follow the animal immediately after shooting, it is best to wait for 30 minutes to an hour before starting out, unless rain or snow is imminent, or you can see the animal lying motionless. Animals often run only a short distance before stopping to look back in the direction of flight. If nothing further scares or disturbs them, they usually move much more slowly from this point or may even lay down where they are. If you move too quickly and startle the animal, it may quickly move a long way and be much more difficult, if not impossible, to find.

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While waiting to begin tracking, mentally pinpoint the site where the animal was standing when hit, the last place it was seen (or heard), the general direction it appeared to be heading, and any landmarks that mark these places. Take compass readings of all these points from the spot where the shot was taken, especially if in unfamiliar territory. This is also a good time to mentally review the shot itself and how the animal reacted.

After having waited an appropriate time, you should first check the shot location for any blood, hair or feathers, bits of bone, or any other signs. If bow hunting, look to see if the arrow can be found, as it may have passed through the animal. Its condition may indicate how successful the shot was and where the animal was hit. Mark the site with colored flagging, bits of toilet tissue, or other similar material. Begin looking for a blood trail, or any scrapes, broken twigs, or disturbed leaves, in the direction that the animal was last seen to go. Mark each of these sites for future reference if needed. (Be sure you remove all markings after finding the animal.) Stay well to the side of the trail so as not to disturb it. Move slowly, and as quietly as possible to prevent spooking the animal if it is alive and nearby. Be sure to look carefully ahead and around you, and not just at the trail, as the animal may be down or standing and unaware of your presence.

Approaching Downed Large Game Animals

As soon as the animal has been spotted, freeze where you are and observe it. Any animal that is obviously still alive, whether standing or laying down, should be given a finishing shot. If a clear shot to the heart-lung area is available, take it. If the shot is not possible from where you are standing, determine if it is possible to move to a better location without spooking the animal or wait until the animal changes position to where a vital area is presented. Shooting in the head or neck area is not an option for bowhunters, due to the dense bone and connective tissue in the area. This shot should be taken with a gun only if the hunter is close enough to be sure of accurate placement.

After observing the downed animal carefully for several minutes and seeing no signs of life, such as movement in the chest or other body areas, the animal may be approached from the topside (toward the animal's back). Observe the animal's eyes. If the eyelids are closed, blinking, or squinting, the animal is alive and extreme caution should be used, especially with large or antlered animals. Back off and administer a dispatching shot. It is better to use an extra bullet or arrow than to prolong the death or possibly injure yourself.

If the eyelids are open, and the eyes are staring and glassy, the animal is probably dead. If it does appear dead, use a long stick to poke it in the rear quarters or flank area. If there is no response to this, use the stick to touch the eye (if a stick is not available, sand or small pebbles can be used). If the eyelids do not blink or close, the animal is ready to be tagged and field dressed.

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HUNTING SKILLS—Review

1. Give two reasons why good marksmanship is important to the responsible hunter.

_____
_____
_____

2. What is meant by "self-control" and why is this important while hunting?

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_____
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3. Name several things to consider before deciding between "shoot" and "don't shoot."

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4. Where is the recommended "vital area" on an animal, and why is it called this?

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5. Why should a responsible hunter learn the techniques and patience needed to track animals?

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9 Game Meat Care

Game Meat Care—Key Terms

Boning—Removal of meat from a carcass for processing without cutting through the bones.

Entrails—Intestines and inner organs.

Field dressing (Game care)—Removing the entrails from game to prevent its meat from spoiling.

Game check stations—Checkpoints established by law or regulation where hunters must always stop.

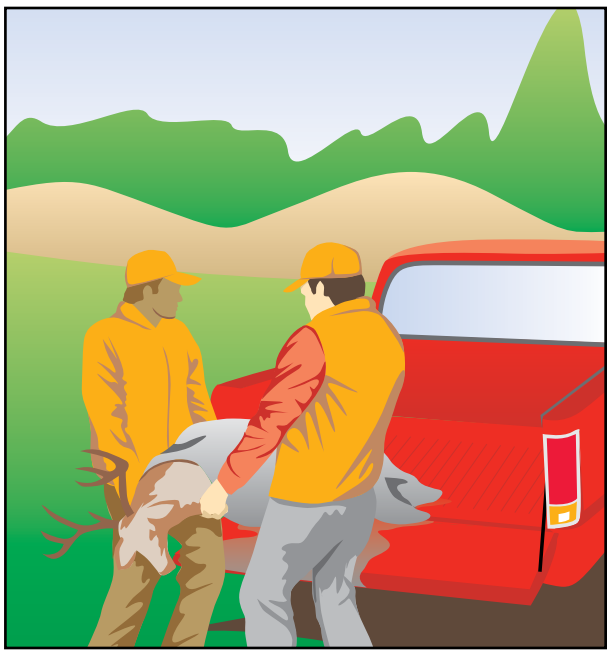
Quartering—Separating a carcass between the front and rear legs, and between the right and left sides, usually for ease of carrying from the field.

Tagging—Proper and legal attachment of a tag or coupon to a game animal prior to leaving the site of the kill.

Wyoming and most other states have regulations against waste of game. You must know these rules. Once you have legally taken a game animal, be sure to follow legal requirements for possession of game. When tagging the animal is required, the tag must be attached **prior to leaving the site of the kill.** In most cases, it is best to apply the tag before beginning field dressing. Many areas require you to bring the animal to a game check station, or there may be collection sites such as "wing barrels" for upland birds.

How you handle the game in the field affects how it will taste on your dinner table. Any game makes better table fare if it is immediately *field dressed* after being taken. This means the removal of the **entrails** (intestines and internal organs) only. How far you can dress game in the field is spelled out in your regulations booklet.

In particular, you must know the rules on birds. In some areas, only the entrails may be removed. Other regulations permit further dressing if one wing is not plucked and/or the head is left untouched. This way, wildlife officers can identify the species and sex. Be sure you know what is legal.



Tag deer. Fill out tag completely. Check state regulations on placement of tag.

At the check station.

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The three major things that cause game spoilage are *dirt, heat,* and *moisture*. Quick field dressing of game is important. Meat should be kept cool, dry, and clean.

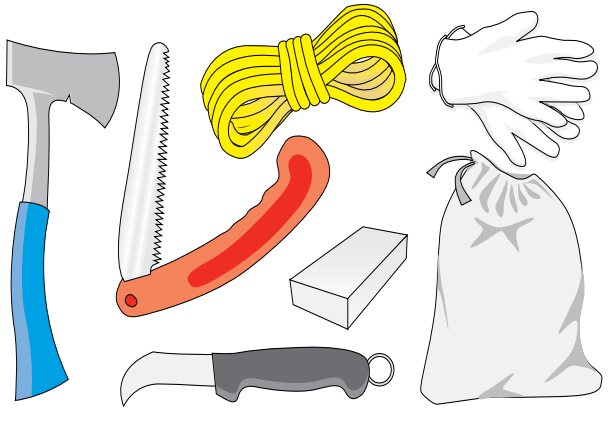
Air temperature affects the quality of game. If the weather is warm, game must be cooled. Keep it in the shade but exposed as much as possible to moving air to help it cool quickly. If game cannot be hung, lay it over brush or tree branches to let air cool it. For larger animals, prop the body cavity open. Protect game from flies and dirt by placing it in a cheesecloth bag or breathable game bag as soon as possible. Sprinkling it with black pepper will help to keep off insects. This is unnecessary if a game bag is used.

Basic Dressing Gear

All hunters should carry a good hunting knife, plus a **whetstone** or similar tool to sharpen the blade. For big game, hunters should carry a light belt axe or folding saw, 10 to 15 feet of sturdy rope, and cloth game bags.

One or more pairs of plastic or rubber gloves should always be included, and used while field dressing any animal. Although wild game animals have few diseases that can be transmitted to humans, these gloves will protect you from any potential exposure. They also serve to prevent contamination of the game meat from any debris or bacteria on your hands.

Cloth or plastic bags should be brought along to carry the heart and liver.



Basic field dressing gear.

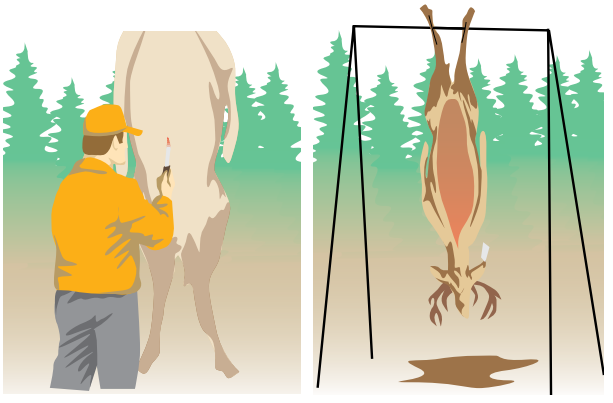
Field Dressing

The key to preventing meat spoilage is fast and careful handling of game in the field.

If you plan to have your game or bird *mounted*, it is best to talk to the taxidermist before going hunting. He will recommend the procedures for field dressing and skinning the animal that will give the best results for mounting.

Upland birds and waterfowl may be field dressed quickly and easily with one knife cut. Insert the blade in the belly skin at the anus and then cut up to the breastbone. Take care to cut only the skin, not the entrails. Reach in and remove the entrails. Wipe the inside of the bird dry with grasses or a rag. A stick to prop the body open helps cool the bird.

Small game such as rabbits or squirrels may be field dressed by slitting their underside from anus to breast. Be careful not to cut the entrails. Take out the innards and wipe out the cavity. The animal can now be skinned.



Promptly field dress. Hang to cool.

Large game animals are best field dressed while hanging. If that's not possible, the head should be higher than hindquarters for easier removal of entrails.

Before you begin, roll you sleeves past your elbows. It will be necessary to reach well inside a deer, elk, or bear to do a good job.

Carefully make an entry cut through the belly skin, beginning either in front of the animal's anus or over the breastbone. Insert two fingers into the slit and hold the skin and muscle up. Cut slowly and carefully between your fingers through the skin in the midline of the belly, avoiding the intestines and the bladder. Fluid from these organs can cause strong flavor and meat spoilage. Next, cut through the skin over the

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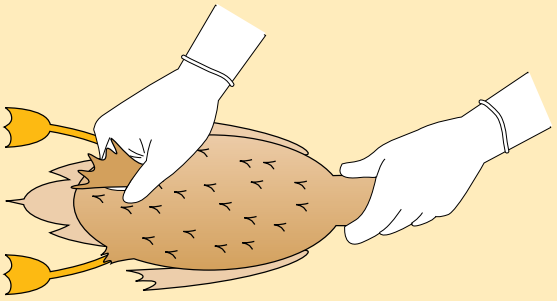
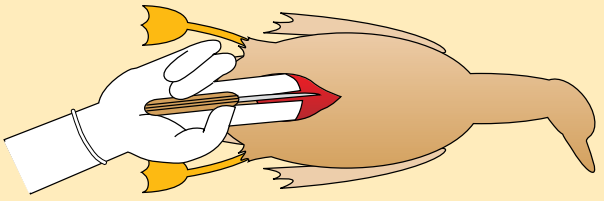
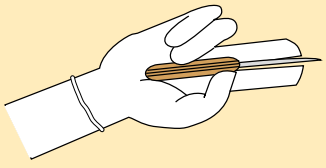
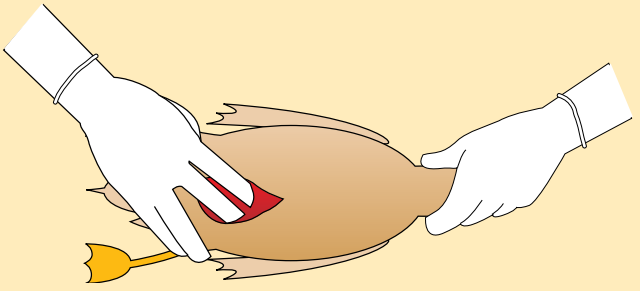




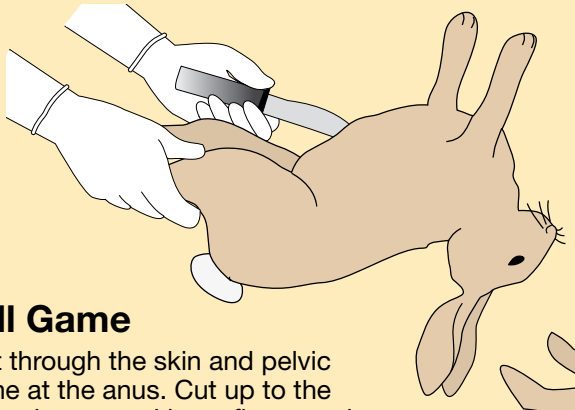
Wear latex gloves.



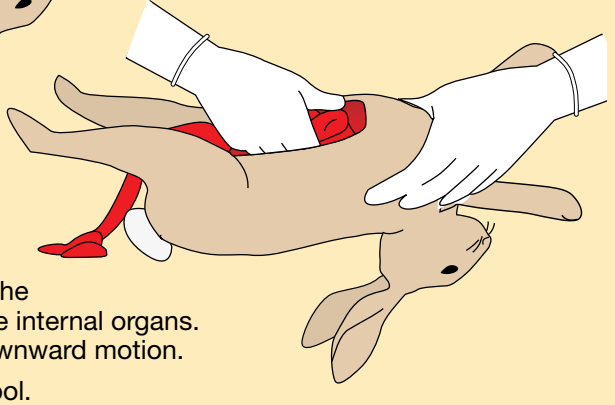


Game Birds

1. Pluck off the bird's belly feathers.
2. Make an incision at the anus, circle it with the knife, then cut up to the breastbone.
3. Insert two fingers into the body cavity and pull free the internal organs, stomach, and intestine. Pull free the lower intestine and anus.
4. Drain the cavity and store the body in a cool ventilated place.



Wear latex gloves.



Small Game

1. Cut through the skin and pelvic bone at the anus. Cut up to the breastbone, working a finger under the blade to avoid cutting the stomach or intestines.
2. Hold the animal with one hand. With the other, reach into the body cavity and pull loose the esophagus and windpipe, and work loose the internal organs. Pull free the lower intestine and anus in a downward motion.
3. Wipe out the cavity, and allow the body to cool.

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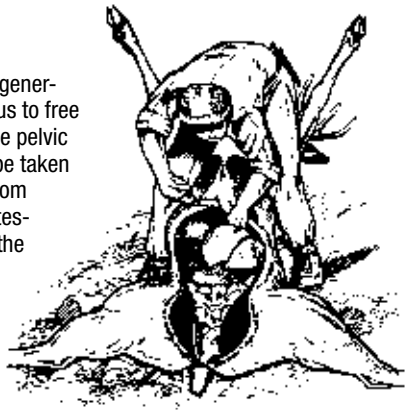
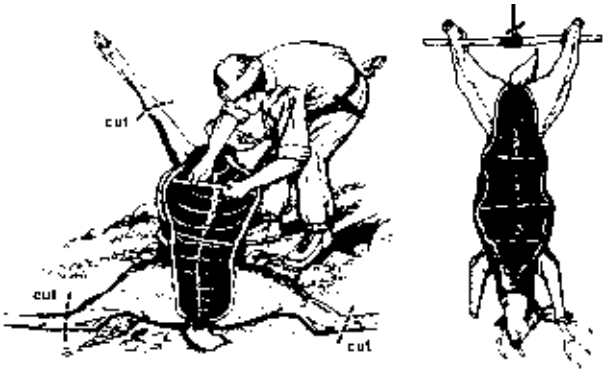
1 The first cut is made by slitting the skin and belly muscle tissue, beginning at the breastbone and cutting to the pelvis. In order to guard against puncturing the intestine, the knife blade should be held with the cutting edge up, using fingers under the blade to separate skin and abdominal tissue from the intestine.



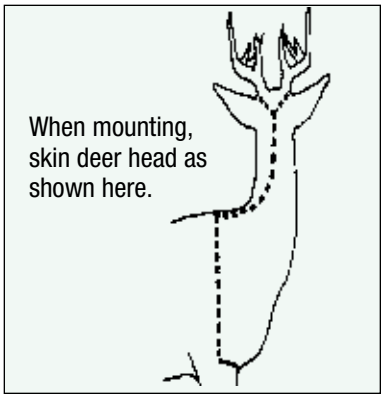
2 Cut deeply and generously around the anus to free the intestine from the pelvic cavity. Care should be taken to keep droppings from spilling out of the intestine, contaminating the meat. The intestine can be tied in a knot or with a piece of string. The pelvic bone should be split to allow removal of the anus and sex organs. This can be done with a heavy knife, but a small ax or saw blade works best.

3 The heart and lungs lie within the chest cavity. You can cut around the diaphragm close to the ribs or open the chest by cutting through the breastbone. Sever the windpipe and esophagus as far up in the throat as possible. In order to pull out the heart, liver and lungs it is necessary to reach deep inside the chest cavity. Most of the entrails will pull away without difficulty but may require a bit of cutting at the back. Care should be taken not to spill the paunch contents or urine. Be certain that the bladder, sex glands and organs in the pelvic region are completely removed.

4 Drain all blood from the cavity and if rags are available wipe it dry. If it has been contaminated by urine or paunch contents, use water or snow to wash out the affected areas thoroughly before wiping dry. Trim and remove damaged and bloody tissue around bullet wounds. These areas will spoil fast if not cared for. The heart and liver are excellent eating and should be washed and placed in a plastic bag for carrying. The next objective is to draw off the body heat as quickly as possible. If the carcass can't be removed from the woods immediately, it must be cooled there. The belly should be kept open with a stick and the carcass placed in the shade, either hung up or resting on some brush. This will allow the entire carcass, including the underside, to cool rapidly.



5 Once you have reached camp, hang the carcass head down and prop it open to allow cooling. Hide removal depends on the situation. Skinning the meat will aid rapid cooling. Leaving the hide on is recommended if weather conditions will cool the carcass rapidly. If such is the case, the hide will protect the meat and insulate it against heat during the day.



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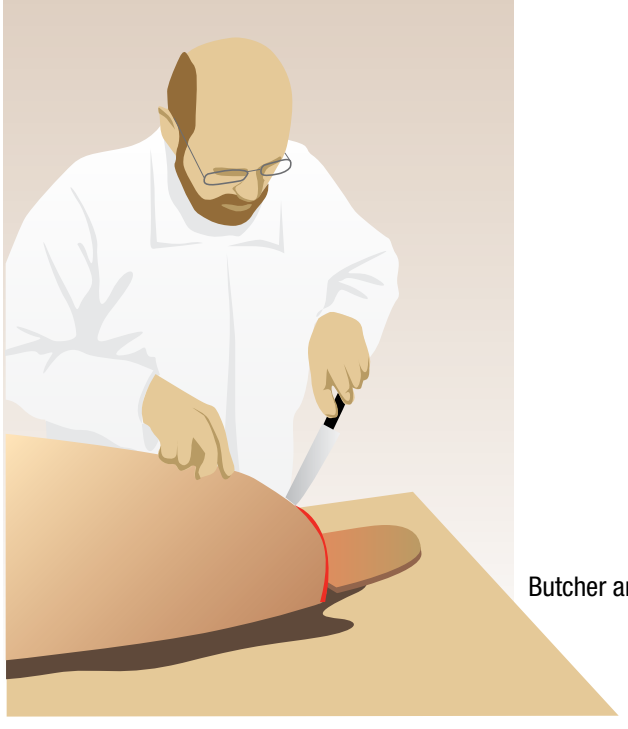
breastbone and along the neck to the head. Then open the chest cavity by sawing through the breastbone or cutting between the ribs and the breastbone. Cut the windpipe and esophagus at the upper neck and tie them off. Slice through the meat between the hind legs. Some people prefer to cut the pelvic bone at this time. Cut around the anus and tie it off to keep droppings from spilling into the cavity. Sex organs may have to be left on for identification purposes.

Grasp the esophagus and windpipe and pull towards the belly, cutting attachments in the chest as you go. Cut completely around and through the diaphragm (thick muscle between the chest and belly), work loose the internal organs and slide them out of the animal. Separate the heart and liver. After cooling, place them in a clean cloth bag. Many hunters consider these organs to be excellent table fare.

Now roll the animal on its side to drain blood by gently lifting the head and shoulders. If paunch fluid or urine has spilled on the meat, wash the body cavity with water or snow. Wipe the body cavity as dry as possible after trimming off damaged or bloody areas.

When cleaning game, be careful not to cut yourself on bone splinters or with your own knife. Be very careful when field dressing large animals that might have arrow broadheads in them.



Butcher and process in a timely manner.

Entrail disposal varies from area to area. What is the law where you hunt? There are good health and sanitation reasons for properly taking care of entrails. Most important is that no organic or visual **pollution** is left behind.

Safe, responsible hunters will never carry deer over their shoulders to camp because there is a chance that other hunters could mistake them for game. It's best to get a friend's help in dragging your deer to camp or to a vehicle. If you carry the deer on a pole between you, bind it tightly to the pole. A swinging deer is very hard to carry. Always have visible markings over a carcass when moving it. Be sure to cover its antlers or upper body with hunter orange material.

Don't carry an unmarked deer.

On your way home with game, follow your area regulations about tags and checking stations. Protect game so that it will not spoil.

It is irresponsible to display your game kill to the world on top of your vehicle, or to mount its head on your bumper. This kind of behavior offends many people. Hunters need public support from people who don't hunt but do respect wildlife. Pack game home covered, wrapped, or in a closed vehicle whenever it is legal. If you want to show your harvest to your friends, do it with pictures.

Carrying your game on the vehicle will expose it to road dirt, exhaust fumes, dust, and the weather. Also, heat from direct sunshine or the engine will spoil the meat.

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GAME MEAT CARE—Review

1. When should you properly tag your game animal?

_____

_____

2. List three major causes of game spoilage and a way of preventing each of them.

_____

_____

_____

3. Name six things that should be carried as basic field dressing gear for large game.

_____ _____

_____ _____

_____ _____

4. Fill in the blanks below to show the steps of dressing upland birds and waterfowl.

_____

_____

_____

_____

_____

5. Why do safe hunters not attempt to carry deer over their shoulders to camp?

_____

_____

6. Besides being offensive to others, why should game not be carried on the hood of a vehicle?

_____

_____

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10 Wildlife Management and the Role of the Hunter

Wildlife Management—Key Terms

Biological surplus—Numbers of wildlife produced in nature above the carrying capacity of the habitat; those not needed for reproduction of the species.

Carrying capacity—Number of wildlife each habitat can support throughout the year without damage to the habitat or the wildlife.

Conservation—Wise use of resources.

Endangered species—Species that face extinction in all or a large part of its range, and are protected by law for this reason.

Extinction—The death of all animals within a species.

Game—Wildlife that may be hunted or trapped according to legal seasons and limits.

Habitat—Environment that provides everything wildlife needs to live: food, water, cover, space, and arrangement.

Migratory game—Game which leaves the area in which they are raised.

Non-game—Wildlife not normally hunted.

Population—All the members of a given species of animal within a defined area.

Predators—Animals which live mostly by killing and eating other animal species.

Preservation—Non-use of resources.

Prey—Animal hunted or killed for food by other animals.

Protected species—Species protected by law for any reason.

Wildlife—Non-domesticated animals, including mammals, birds, and fish.

Wildlife management—Wise use and manipulation of renewable resources. It is a field of study based on scientific fact.

History and Heritage of Wildlife Management and Hunting

For thousands of years early humans were called "hunter-gatherers" and were scattered in small family groups over large areas. They not only depended on the environment for survival, they were a part of the environment. There were so few of them they probably had very little effect on the plants and animals where they lived.

Gradually humans learned how to plant crops and domesticate animals. Their populations began to grow, and most of them would settle in valleys and other prime areas. The land around them was used for farming, and the areas where wildlife could live slowly decreased.

As human populations continued to grow, the only remaining wild or natural areas were in small areas, called preserves, which were owned by wealthy or ruling families. The concept of game management actually began in these preserves in Europe hundreds of years ago. "Game keepers" were hired to protect the reserves from poachers and keep the animals healthy. The wildlife was the property of the king and could only be hunted with his permission. In the year 1215 the king was forced to sign a document that said the wildlife were owned by the parliament. After the United States became a separate country, the Supreme Court determined that wildlife belonged to *all of the people*, and not to any one person, group, or government agency.

The early settlers of this country used the land, trees, water and wildlife for their survival. To them these natural resources appeared unlimited. Large and small game animals, along with birds and fish, became a good part of their diet. Some people made a living by killing large numbers of animals and selling the meat in the larger cities. They were called "market hunters." Along with this uncontrolled killing of animals, much of the land was cleared of trees and brush for planting of crops, so there was less space for the remaining wild animals.

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The Goals of Wildlife Management are:

- Managing and conserving wild, free-ranging animals and their habitats.
- Maintaining enough individuals in a wildlife population to support the species and satisfy the desires of the public, but no more than the habitat can support without damage to the environment, to the animals themselves, or to other species.
- Conducting research into understanding the relationships of people, animals and the environment.
- Providing opportunities for the public to utilize the natural resource through hunting, fishing, and wildlife viewing.
- Designing and enforcing laws and regulations where necessary for the protection of both wildlife and humans.
- Controlling problem species or individual animals.
- Managing human activities as they relate to wildlife or habitat.
- Educating the public about the interrelationships between man and the environment, and the potential and real effects on wildlife populations.

Because of this unrestricted hunting and loss of habitat, many wild animal populations decreased rapidly. In the 1800s some species, such as the heath hen and passenger pigeon, became extinct and many others were reduced to near extinction. White-tailed deer and wild turkey, which had been abundant in eastern North America, became so rare that sightings were reported in the newspapers.

As people started moving across the country to the west, the loss of wildlife and their natural habitat followed. Bison, elk, pronghorn antelope, and other game animals were hunted for meat, hides, teeth, and even bones. They were nearly exterminated.

As early as the 1600s hunters, anglers, and other sportsmen's groups became aware of these losses. They asked for and helped pass the first hunting and fishing laws. Several attempts at local closings were made, with Portsmouth, Rhode Island, having possibly the first hunting regulations in 1646. In 1708, New York established closed seasons on turkey, quail, grouse, and heath hen. Although strongly backed by sportsmen and their organizations, these laws provided no real method for enforcement and had little effect.

The biggest changes in management of wildlife and environment came in the late 1800s and early 1900s Men like President Theodore Roosevelt were sportsmen who helped establish game reserves, national parks and forests, and many hunting, fishing and conservation laws.

In the 1930s wildlife management became a separate branch of study and profession. The textbook *Game Management*, written by Aldo Leopold, was the first to be published on the subject. College courses in wildlife and habitat management were being instituted, and Leopold became the first professor of game management.

Modern wildlife management involves the use of scientific study to maintain healthy populations of wild animals. These wildlife need the right types and amounts of habitat to survive. Much of the effort in wildlife management is to keep the habitats as close to natural as possible with the increasing effects of human presence.

Hunters' dollars (U.S.)

Money Sources	Time Span	How Used
Hunting licenses	Since 1923	Budgets for state fish and wildlife agencies
Pittman-Robertson Act, excise tax on arms and ammunition	Since 1937	Wildlife restoration projects. Hunter Education
Duck stamps	Since 1934	Acquisition of wetlands for wildlife
Conservation stamp	Since 1986	Wildlife conservation and rehabilitation programs

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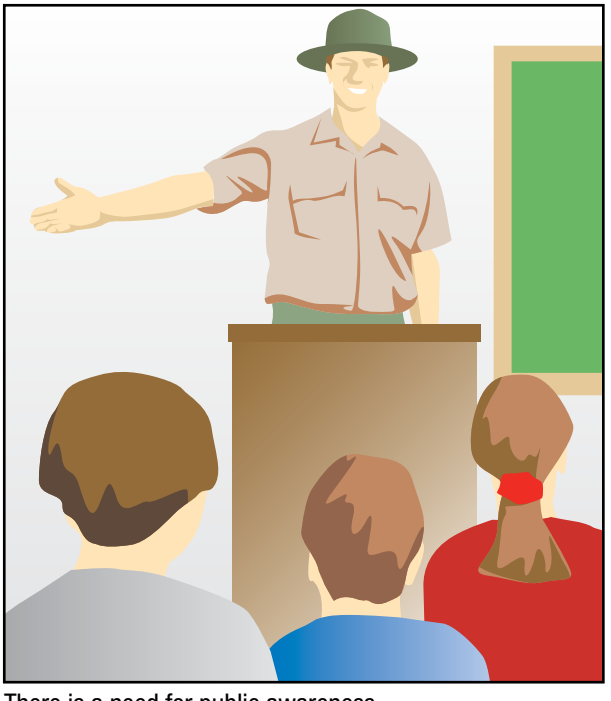
Many people think that wildlife management and conservation are paid for with taxes paid by everybody. Actually, hunters and other outdoor recreationists have provided most of the funding and have been the leaders in efforts to protect all wildlife and the environment. The Federal Aid in Wildlife Restoration Act (better known as Pittman-Robertson) was passed in 1937 at the request of hunters. This act means that hunters pay an extra 11% excise tax whenever they buy guns or ammunition. This amounts to hunters asking for a tax on themselves. A similar excise tax was passed later on fishing supplies (Dingell-Johnson Act). Waterfowl hunters must also purchase a Migratory Bird Hunting Stamp ("duck stamp"). The money generated by these acts is returned to each state's wildlife management agency. This money, plus income from selling hunting and fishing licenses, provides almost all of the funds for the management of wildlife habitat and for Hunter Education programs.



There is a need for public awareness.

Hunting is also good for the economy of local areas and the nation. U.S. Fish and Wildlife Service surveys show that hunters and anglers spend over $70 billion a year on their pastimes. Numbers this large are hard to even picture. To make a comparison, a very popular movie such as Star Wars, Jurassic Park, Titanic, etc. can make $45—50 million in their best weekend. Hunting accounts for over twice that amount the same weekend—*and every other weekend.* While you watch a one hour TV show (or an hour of Hunter Education class) over *$150,000* is contributed to the economy by hunters.

Pittman-Robertson Act Facts

- Actually called the Federal Aid in Wildlife Restoration Act, P-R was sponsored by Senator Key Pittman (Nevada) and Representative A. Willis Robertson (Virginia). President Franklin Delano Roosevelt signed it into law in 1937.
- It is an excise tax on firearms, ammunition, and archery equipment, and is administered by the U.S. Fish and Wildlife Service.
- Sixty two percent of P-R money available to the states is used to buy, develop, maintain, and operate wildlife management areas.
- Twenty six percent of the P-R money available to the states is used for surveys and research necessary to restore wildlife.
- Seven percent of the P-R money available to the states is used to finance Hunter Education. These programs reach about 650,000 people a year.
- People who never hunt benefit from P-R, too. Wildlife management areas and wetlands are used by all nature lovers and wildlife watchers. Funds go towards management of all species, game and nongame alike.

Although most of the funding and effort for wild animals and their wild habitat has come from hunters and anglers, any citizen can enjoy the benefits. More and more people are heading into Wyoming's great outdoors for hiking, camping, sight seeing, wildlife viewing, photography and other recreational purposes. While these uses are perfectly legitimate and proper, they don't involve buying hunting and fishing licenses or equipment, and don't provide more funds for management.

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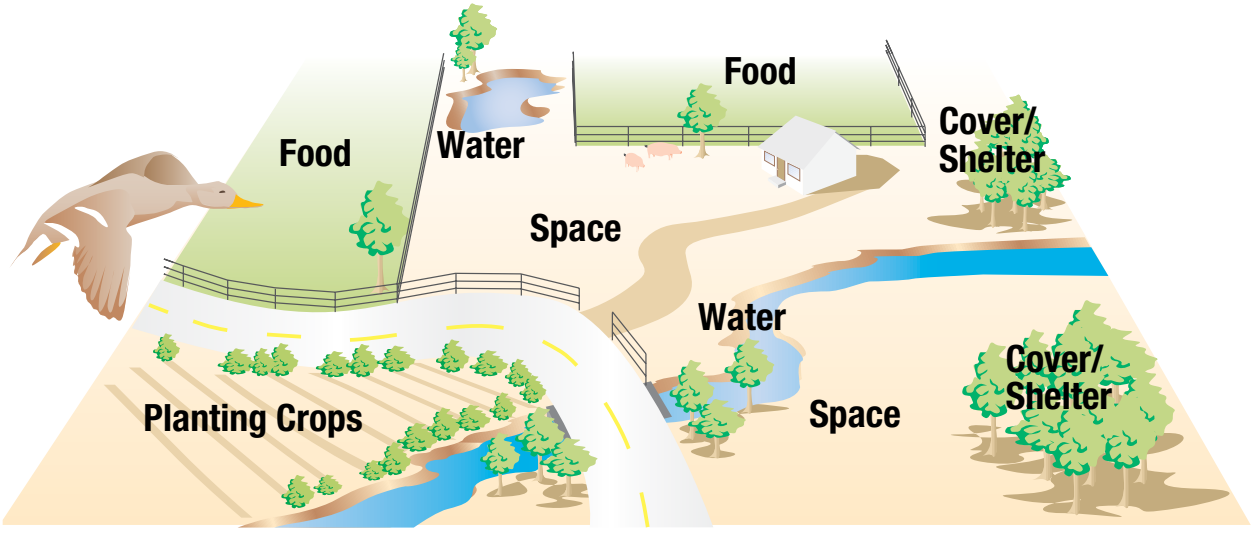

The edge effect among the different habitat elements: food, water, space, cover, and arrangement.

Along with this change in users, more and more of the necessary research and effort are for nongame animals, especially threatened or endangered species. Also, more time has to be spent on things associated more with human usage (education, enforcement, habitat damage, etc.) than with the wildlife needs. All of this is necessary and important work but adds very little to money needed for conservation.

Wildlife and Habitat

The term "wildlife" means all non-domestic (also called free-ranging or outdoor) animals. Only a few of these are hunted, trapped or fished, most of them are nongame animals. Some of these are threatened or endangered species. Most often when people think of wildlife, they picture mammals, birds and fish. The term can also be used for other animals such as reptiles (like snakes and turtles), amphibians (frogs, toads), and insects.

The part of the environment that supplies an animal's needs is called its *habitat.* The five elements that are essential for a suitable habitat are *food, water, cover, space,* and the proper *arrangement* of these elements.

Food. Both the amount and kind of food available are important. Each wildlife species needs certain types of food.

Water. All animals need water to survive. This can be surface water such as lakes or streams, dew, snow, or moisture from plants and food.

Cover. Sheltered or hidden areas can be from trees, bushes, or other vegetation, or such things as rocks, caves, cliffs, or burrows.

Space. Each species needs a certain amount of territory for feeding, and activities such as mating, nesting, or bedding down.

Arrangement. How the food, water, cover, and space are arranged in an area determines how many animals can live there. The best arrangement is when the habitat factors exist in small blocks close together, such as when cover is directly beside feeding areas or water. This is called the *edge effect*. Larger numbers of individuals, or different species, are usually found in these areas.

In order for a species to survive in nature, animals not only reproduce but also have developed the ability to increase in numbers. Even though any pair of animals needs to produce only two offspring throughout their life to replace themselves, actual production is nearly always much greater. This is called the *biological surplus*. The amount of this surplus varies between species, but some are capable of very rapid population growth. For example, while a deer may produce 5-10 fawns in her life, a cottontail rabbit may have 10-20 offspring every year. Many fish lay literally thousands of eggs as potential offspring each year.

Huge increases in population obviously cannot occur every year. There is only enough habitat to support a certain number of animals through the entire year. This is the *carrying capacity* of the habitat. The carrying capacity is usually determined by the essential environment factor (food, water, cover, space, and arrangement) that is in shortest supply or is least available. For example, if there is enough space, cover, and water in a favorable arrangement for 100 deer, but there is only food enough

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for 20 deer, the population will be limited to 20. If more animals are present than the carrying capacity of the area can support, the habitat itself may be badly damaged and unable to support the original population.

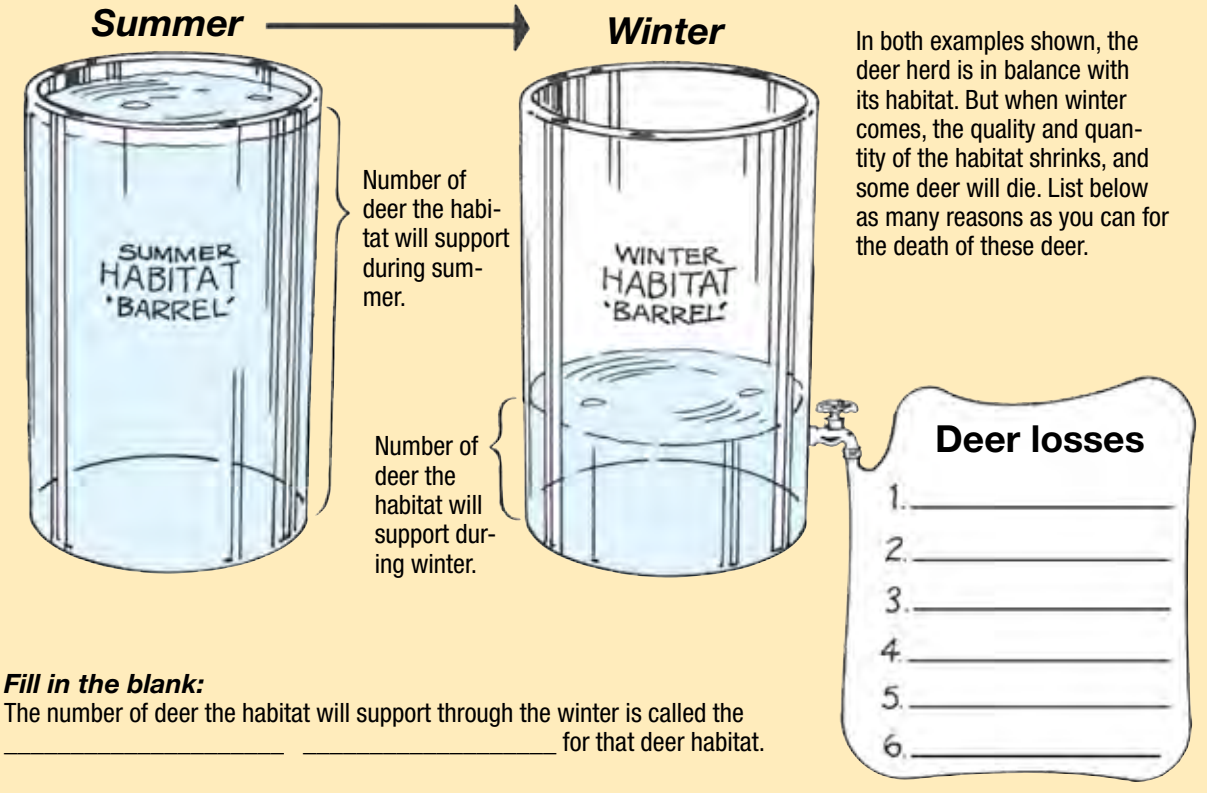
The carrying capacity of an area is usually greatest in the spring and summer. Most animal populations will increase during this time due to reproduction and any immigration of animals from other areas. In late fall and winter (or other times of stress, such as drought, flooding, etc), the habitat can't support that many animals. Some of the animals will not survive because of what are called '*limiting factors*'. Typical limiting factors in nature are starvation, predators, old age, diseases/parasites, accidents, severe weather, and hunting. The number of animals that survive the worst environmental conditions is often called the '*critical carrying capacity*'. The number of animals in the summer population that normally are not going to survive through the winter's harsh conditions is the true biological surplus of that species. This surplus of game animals is produced every year and can be harvested without any danger to the overall population.

Wildlife Management Tools

Tool	How Used	Why Beneficial
Fire or burning	In forests and brushlands, to return area to earlier stages	Creates new growth
Hunting	Controls game herd populations	Animal population does not exceed carrying capacity of the land
Food plots	For upland game and some waterfowl	Creates winter food source
Shelter belts	For protection and nesting cover	Protects upland game some big game, and nongame
Timber sales	Opens canopy. Trees are cut to encourage undergrowth	Creates grasses and weeds. Helpful to early successional species

Since it is the habitat that limits animal populations, the only way to increase animal numbers is to increase the carrying capacity or the total amount of the habitat. This can be through habitat improvement techniques or enlarging the total amount of habitat. Even under the best conditions and best development, however, there is

Winter pinch period



Fill in the blank:
The number of deer the habitat will support through the winter is called the _____ _____ for that deer habitat.

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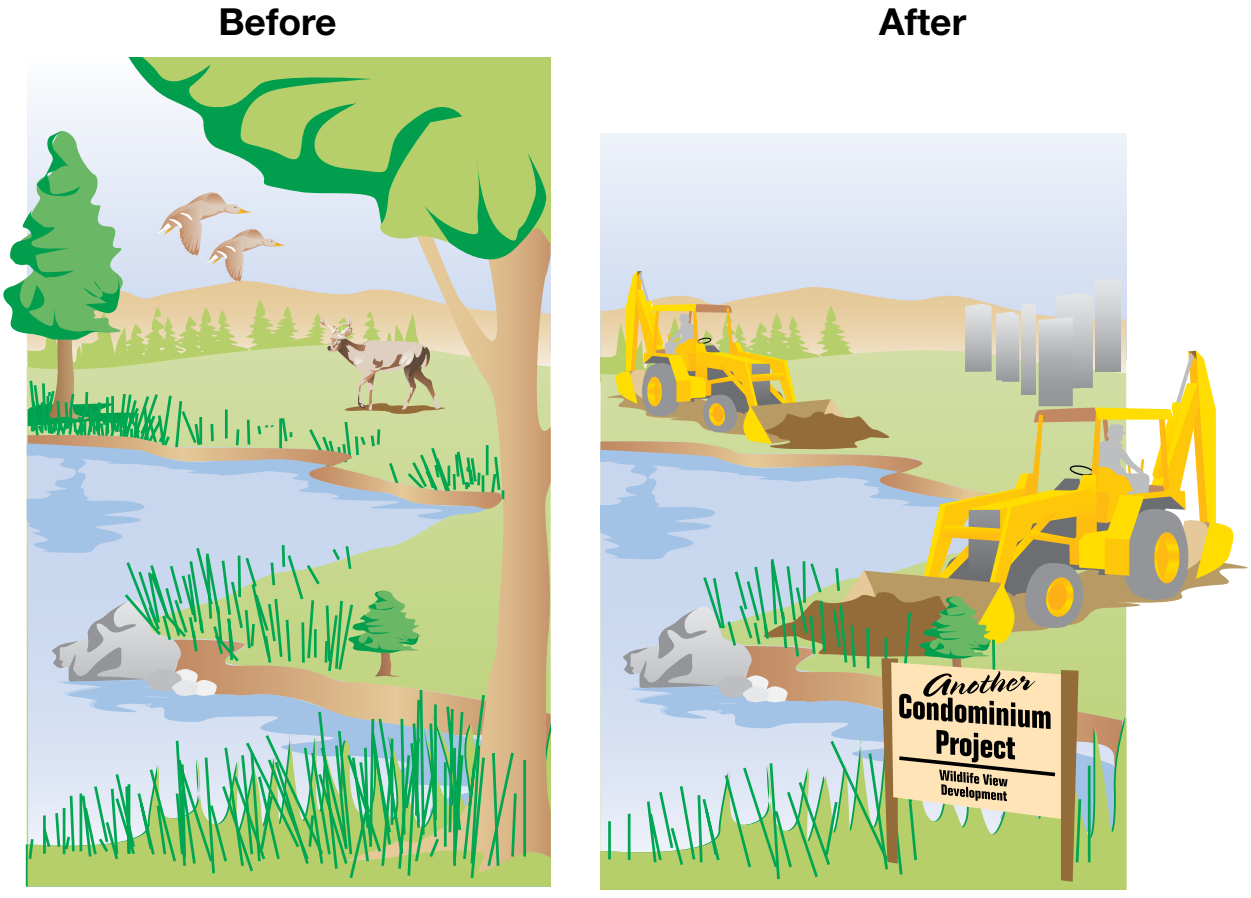


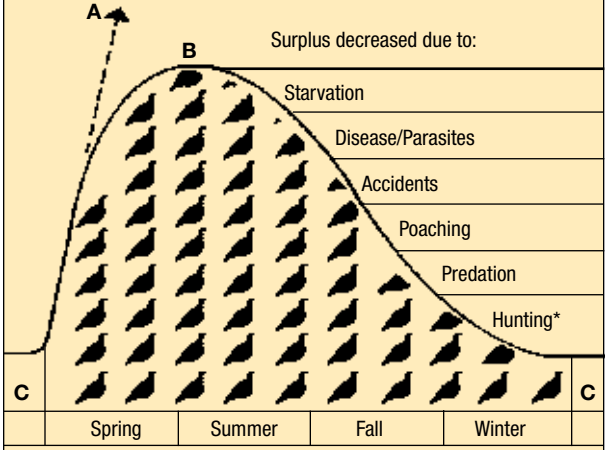
The effects of urbanization on habitat.

a maximum amount of production in an acre of land or water. The habitat cannot produce more plants and animals than this amount.

In Wyoming, about half of the land is public land managed by the state or federal government. The other half of the land is owned by private individuals. Most of the private land is on farms and ranches at lower elevations, often with a water supply and better habitat. Many wild animals and birds live on this private land all year, and others move there in the winter. Since winter is the hardest time to survive, private farm and ranch land is very important to wildlife.

The number and different kinds of animals is directly related to the amount and quality of habitat available. Over most of the last century, the biggest single factor involved in decreasing animal populations in this country is the loss of habitat.

Carrying Capacity



A Unrestricted production if no limiting factors existed
B Average yearly game production
C Annual breeding stock
* Hunters take animals from the annual surplus that would be lost anyway

Carrying capacity of the land increases in early summer when there is a lot of food and cover. This healthy habitat is soon filled by the new broods of birds. In late summer, when the population and the available food and cover reach their peak, some birds begin to die.

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Natural Resource Management

Wildlife are what is called a natural resource. Some things in nature, such as coal, oil, gas, and minerals are called nonrenewable resources since they do not reproduce to replace themselves. Whenever any these resources are used, there is less of it left to use later.

Renewable resources, such as animals, trees, and grasslands, are living things that do have the ability to reproduce themselves if they are not completely removed. Since each individual animal will only live for a certain amount of time and then will die, they cannot be stockpiled or saved for later use. The population of animals, however, can continue on indefinitely if enough reproducing animals are left. Another way to describe a renewable resource is that even when it is used, the total amount left for later use remains the same.

Two different ways to manage renewable resources, such as wildlife, are called conservation and preservation. *Conservation* means the wise use of a resource. The excess production (biological surplus) can be used every year as long as enough animals remain in a healthy environment to reproduce the following year.

Preservation means not using a resource at all, with the goal of "preserving" it in its present state for possible later use. We sometimes do have to help preserve animals that are in very small numbers, have lost most of their habitat, or are otherwise endangered. These animals, and their habitats, often need intense management.

Preservation is supposed to work by providing wildlife with an area free from all human presence where animals can return to "natural balance." From earliest history up through today, humans have already changed the environment to such a degree that natural balances are no longer present. Natural vegetation has been removed or replaced by farm crops, predators are no longer present and cannot be brought back in most areas, and most remaining wild areas are simply too small for natural balances to work. Without management, some species would overproduce and harm the environment or other species, while others would not be able to survive and would die out. In addition, with preservation the biological surplus normally produced by healthy populations would not be utilized.

Not only do we have a responsibility to wisely manage wildlife and its environment but it is also in our own best interests. The different species of wildlife all share with each other, and with us, the same air, sunlight, water, and other things that make life possible. All natural resources of the environment will be just as necessary for future generations as they are for us. We need to manage both the renewable and nonrenewable resources wisely so they will still be available in the future.

The Kaibab Plateau of Arizona

In the early 1900s, a large, healthy mule deer herd was present. Attempts were made to "preserve" the area by closing it to hunting. Very few predators were in the area. The deer herd increased over a few years, but soon became too large for the habitat. The deer ate all the vegetation to where it could not even regrow during spring and summer. Large die-offs of deer from starvation began and continued over several years. Attempts were made to herd the deer to better feeding areas but none could be moved. The starvation and dying continued until very few deer remained. The foliage slowly began to regrow. The area was reopened to hunting in 1929 to keep the deer population in balance with the habitat. Today, the Kaibab once again has a large and healthy herd of mule deer. This incident was a striking example of the need for management of wildlife and their habitat.

The North American Model of Wildlife Conservation

You can't drive across Wyoming during daylight hours without seeing pronghorns. Depending on the route and the distance, you might see more than you could possibly count.

But it wasn't always that way. There was a dark time in the history of the West when game animals like pronghorn, bison, and elk were pushed to the brink of extinction. What many people don't realize is that hunters were responsible for saving those species.

From nearly the first day Europeans set foot on this continent, they saw the resources of the new world, including its wildlife, as a bounty anyone could enjoy. In part because the new arrivals thought the wildlife populations of the Americas were inexhaustible, this new notion of wildlife belonging to all took hold.

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It didn't take long for the European newcomers to start depending on this wild abundance. Many took only what they could use themselves, but others made a living by hunting, fishing, and wildlife to sell.

But as the human population in North America expanded, the commercial use of wildlife had an increasing impact on the wild herds. Passenger pigeons had been hunted to extinction. Elk, bison, and pronghorns were not far from the same fate. Something had to be done.

George Bird Grinnell, Theodore Roosevelt, and a number of other hunters recognized the damage that unregulated hunting was doing to the resource. These men and many others helped shape what we know today as the North American Model of Wildlife Conservation.

These conservation leaders also helped further the concept of a "sportsman's code." This code included the concepts of fair chase and other ethical practices that today define good sportsmanship in the field.

Various groups and organizations, such as the Boone and Crockett Club, the Audubon Society, and the American Ornithology Union, helped inform the public of the dangers of market hunting. They also helped form these seven principles upon which the North American Wildlife Conservation Model is based:

- Wildlife is public property. The government holds wildlife in trust for the benefit of all people.
- Wildlife cannot be slaughtered for commercial use. This policy eliminates trafficking in dead game animals.
- Wildlife is allocated by law. Every citizen in good standing—regardless of wealth, social standing, or land ownership—is allowed to participate in the harvest of fish and wildlife within guidelines set by lawmakers.
- Wildlife shall be taken by legal and ethical means, in the spirit of "fair chase," and with good cause. Animals can be killed only for legitimate purposes—for food and fur, in self-defense, or for protection of property.
- Wildlife is an international resource. As such, hunting and fishing shall be managed cooperatively across state and province boundaries.
- Wildlife management, use, and conservation shall be based on sound scientific knowledge and principles.
- Hunting, fishing, and trapping shall be democratic. This gives all persons—rich and poor alike—the opportunity to participate.

The North American Model of Wildlife Conservation endures today. Through sales of hunting and fishing licenses and taxes on sporting equipment, hunters and anglers bear most of the costs of wildlife management. Sportsmen also contribute voluntarily through donations to conservation groups— whether nationally through groups such as Ducks Unlimited, the Rocky Mountain Elk Foundation, or similar organizations or locally through groups such as the Wyoming Wildlife Federation or Wildlife Heritage Foundation of Wyoming.

It's important to note that the North American Model has benefited more than just game fish and wildlife—countless species of songbirds and shorebirds also are being protected, specifically designated as non-game species.

Unfortunately, even as the human population increases, the percentage of hunters is decreasing. Out of every 100 people in the United States, fewer are hunters now than were hunters 10, 20, or 30 years ago. That means fewer people may be contributing money to wildlife management and conservation.

The North American Model of Wildlife Conservation has brought the pronghorn back from the brink of extinction. It also has played a part in saving the grizzly bear, the bald eagle, the black-footed ferret, and countless other species. Hunters have traditionally done their part to ensure the survival of wild species, and it's vital that they continue to do so. Others who appreciate wildlife but do not hunt also do much for wildlife. Hopefully, these groups and others will help even more to finance wildlife management.

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WILDLIFE MANAGEMENT—Review

1. Name two factors that caused wildlife populations to decrease rapidly in the 1800s.

_____ _____

2. What group of people has been most responsible for the passing of game laws and the funding for wildlife and the environment?

_____

_____

3. Define "wildlife management."

_____

_____

4. List three major sources of funds for wildlife management

_____ _____ _____

5. What are five habitat needs of wildlife?

_____ _____ _____

_____ _____

6. Explain the following terms:

Habitat _____

Carrying capacity _____

Biological surplus _____

Limiting factors _____

7. Compare the terms "conservation" and "preservation."

_____

_____

_____

_____

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The Tradition of Wildlife Management in Wyoming

Wyoming Territory

Even before Wyoming became a state, people in the area started to see the importance of their wildlife and other natural resources, and the danger of not taking care of them. They began to make game and fish laws and licensing procedures that often served as models for other states.

The first territorial legislature in Wyoming passed the "Act for the Protection of Game and Fish in the Territory of Wyoming." This was in 1869. This act restricted the sale of big game meat, set dates when upland birds could be hunted, and stated that trout could be caught only "singly"—with a hook and line. Although the law was hard to enforce, it showed a very early concern for wildlife by the people. The position of "state" fish commissioner was established in 1879. Other laws that were passed in 1882 set the first big game seasons (Aug. 1—Nov. 15), stated that nets and dams in streams must allow for fish passage, and were among the first to try to control water pollution.

The loss of many types of wildlife was becoming critical around this time. In 1876, 80,000 buffalo hides were shipped from the Wyoming region to Missouri. Eight years later, in 1884, no buffalo hides were shipped. In 1889, the last wild buffalo outside Yellowstone National Park was killed. By the early 1900s the number of deer, elk, moose and antelope had also decreased to very low levels and these once common animals were often hard to find.

Statehood

Wyoming became the 44th state in 1890. In 1895, the fish commissioner also became the state game warden. Twenty unpaid deputy wardens were appointed throughout the state. A separate office of State Game Warden was established in 1899 and funds were made available to pay assistant state wardens $1-$3/day of service. This same year, the legislature passed a large number of laws concerning wildlife conservation. Many of these laws are still in effect today, over 100 years later.

The new idea of issuing and requiring licenses for hunting was being tried in several states about this time. Wyoming's first hunting license was started around 1895. This license had tear-off coupons attached for each of the game animals to be hunted. The coupons were to be removed and mailed to the state game warden. Once the coupon was used, no more of that species could be hunted. The license cost $1.00 for residents of the state and $20.00 for nonresidents. By 1908, the fees had increased to $2.00 for residents, and $50.00 for nonresidents. Residents were only required to have a license if they hunted outside their home counties.

The enactment of hunting license laws served two major purposes. First, it allowed for the protection of game by controlling hunting. And secondly, it served as a mechanism for raising revenue for use in the management of the state's wildlife. Wyoming's idea of licensing hunters was catching on across the country. Two-thirds of the states now required hunters to purchase licenses, and many of the older states had just recently copied the Wyoming system.

Licenses for fishing were still not required at the time the hunting license laws were enacted. The first fishing license bill was proposed in 1911, but was not passed until 1919.

WYOMING BIG GAME POPULATION ESTIMATES

Animal	1923*	2000
Pronghorn	13,895	457,146
Mule deer	20,330	544,875
Elk	22,572	105,868
Moose	3,725	14,400
Bighorn Sheep	2,585	6,483
"Bear"	1,492	?
Bison	24	2—4,000

*First systematic census

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Wyoming Game & Fish Commission

The Wyoming Game and Fish Commission was created in 1921. The original commission consisted of the governor, secretary of state, state auditor, the game and fish commissioner appointed by the governor, and the assistant commissioner. Four years later the makeup of the commission was changed to 6 citizens from throughout the state appointed by the governor, with no more than 3 from one political party, and with staggered 6-year terms. There are now 7 commissioners, with no more than 4 from the same political party. The purpose of the Commission is to coordinate all efforts related to managing the state's wildlife.

Wyoming Game & Fish Department

The Wyoming Game & Fish Department (WGFD) manages all the wildlife within the state (not just game animals) for the benefit of all the people of the state and for the generations of people in the future. It takes many people with different talents to do this. The department employs over 400 people throughout the state, including biologists, engineers, educators, game wardens, and many others.

At the present time, the WGFD is responsible for over 800 species of animals in the state. Of these, about 100 are considered game animals and are either hunted or fished, while over 700 are nongame animals that may be abundant, uncommon, threatened, or endangered.

By law, wildlife are owned by all the people in the state and not by any one person or group. The Wyoming Game & Fish Department and other agencies throughout the country take care of the wildlife for the public. The Department does not own the wildlife, but is responsible for managing it for you and for future generations. The excess production can be used by hunting, fishing, wildlife viewing, etc. The department also keeps you informed about wildlife, and responds to the interests and needs of the public.

Along with this responsibility to you and the public, the Wyoming Game & Fish Department has an equal responsibility to the animals and their habitat. This responsibility is to improve the amount and quality of the available habitat and then maintain all species present within the carrying capacity of that habitat. This involves preventing overpopulation by very common species, giving protection to threatened or endangered species, and improving the habitat for all of them. With proper management, the public can continue to use the outdoors (by hunting, fishing, camping, wildlife watching and other forms of outdoor recreation) while the wildlife and their habitat are maintained and improved for enjoyment by people in the future.

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11 Outdoor Survival

Outdoor Survival—Key Terms

Compass—Instrument for showing direction, especially one consisting of a magnetic needle swinging freely on a pivot and pointing to the magnetic north.

First-aid kit—Kit containing supplies to be used in medical emergencies.

Ground to air signals—Emergency rescue signals made on the ground that can be seen from the air.

Hypothermia—Life threatening condition, in which the body loses heat faster than it can produce it.

Lean-to—Shelter which is open at one side and has a sloping roof/back on the other side.

Orient—To find a location on a map, or to relate a known position to obvious landmarks.

Survival kit—Kit containing equipment to be used for basic survival needs.

Tinder—Any dry, easily flammable material used for kindling fire.

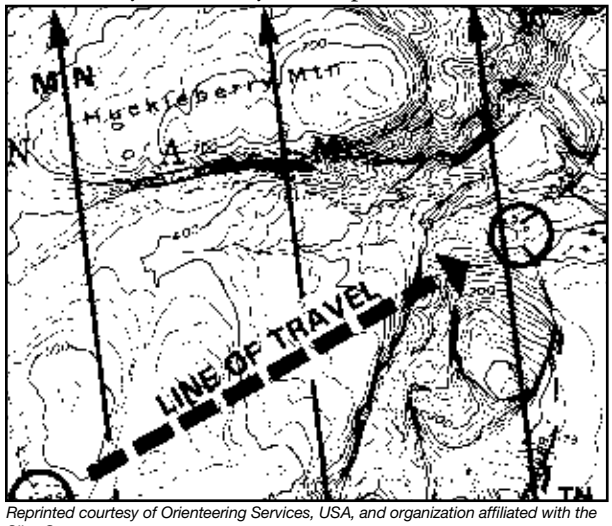
Topographic map—Map with grids, showing details such as roads, elevation, rivers, and types of vegetation.

Introduction

Learning to use a map and compass properly, and being continually aware of landmarks and other terrain features, can help prevent hunters, anglers, campers, or hikers from becoming lost. However, if you do get lost, panic is your greatest enemy. Use your head and you can survive.

Maps and Compasses

All outdoor users should carry and know how to use a map and compass. Safe, responsible hunters will **orient** to their camp or vehicle *before* leaving. This means to find where you are on your map.



Reprinted courtesy of Orienteering Services, USA, and organization affiliated with the Silva Company.

You can get maps from county, state, Forest Service, or many commercial locations. The best are called *topographic maps*. These can be found at sporting goods stores or may be ordered from the U.S. Geologic Survey. These have details marked such as roads, elevation, rivers, and types of vegetation. They look like a drawing of the area made from the air.

Criss-cross **grid lines** divide the map like squares on a checkerboard. The scale of the map tells how much area each square represents. **Contour lines** show how high and steep the hills are. North is always at the top of each map.

In order to use your map and compass, you must know how much east or west *declination* to add to, or subtract from, your compass reading. This is because maps are drawn aligned with *geographic north* (North Pole), while compasses point to *magnetic north* (Hudson Bay area). West declination is added to the compass reading while east declination is subtracted. When you use a compass, be sure you know the proper degrees of adjustment to use for each area you hunt. This information is usually found in an insert or diagram at the bottom of the map.

To get from where you are to another spot, place your compass on the map with the baseplate edge joining the two spots.

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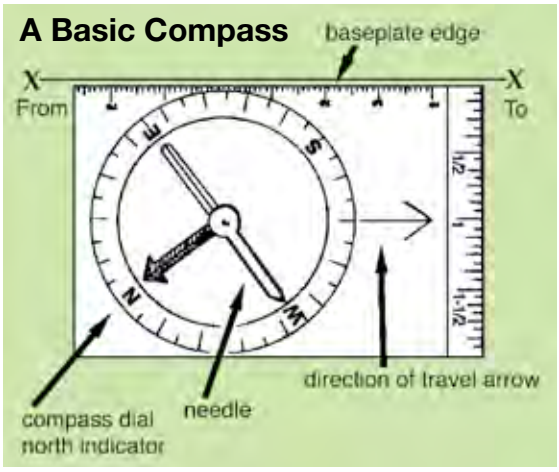

Turn the compass until the "N" points to *magnetic north* on the map (true north, plus or minus declination).

Hold the compass level in front of your with the *direction of travel arrow* pointing straight ahead. Turn your body until the north-pointing end of the needle is directly over the orienting arrow, pointing to the "N" on the dial. The direction of travel arrow now points toward your destination. Look up, sight on a landmark, and walk to it. Repeat these steps until you reach your spot.

To find your way back, point the direction of travel toward your starting point and backtrack. Follow these steps and you'll find your way every time.

A compass needle can be affected by a firearm barrel, buckle, or any large piece of metal. Do not let these get near the compass when taking a compass reading.

If you lose your compass, take out the spare that you wisely carry in your survival kit. If you lose both compasses, you can find north by using a watch that has hands. Hold a wooden match or straight twig up from the center of the watch. Turn until the shadow falls on the hour hand. In North America, north is halfway between the hour hand and 12 o'clock. (During Daylight Savings Time, north is halfway between the hour hand and one o'clock.)

Basic Survival Rules

There are seven basic rules for survival that will help you be prepared:

1. Tell someone where you are going and when you plan to return. If you move from one area to another, tell someone.
2. Never hunt alone.
3. Carry enough food for two days.
4. Take along two compasses and a map of the area, and know how to use them.
5. Wear proper clothing and carry proper equipment. Remember that weather can change.
6. Plan your hunt so you can return to your car or camp one hour before dark.
7. Know how to build a fire and take proper fire-starting materials.

Being lost is serious. It does not have to be dangerous if you react properly. A good word to help you remember what to do is **STOP**. **S**it down, don't panic. **T**hink about your problem. **O**bserve the area. **P**lan what to do. Treat injuries, then find shelter, water, and food.

The first thing you must do is admit to yourself that you don't know where you are. You're lost! Next, it may help to sit down and go over in your mind what you did since leaving your car or camp. What landmarks or markers did you see along the way? Can you see any of these landmarks from where you are now? Have you been going uphill or down? Where was the sun while you were walking? Did you leave enough tracks to follow back to where you started from?

The best advice is to *stay put*. Use your first-aid kit to take care of any injuries. Bleeding and pain make it harder for you to think clearly.

Look for a good spot to *build a small fire*. It will relax and warm you, and making it will give you time to think. Take out your map and compass and study the countryside. You may be able to identify a lake, stream, or mountain landmark that will tell you where you are. If you decide to try to return to your starting point, put out the fire and walk for 30 to 60 minutes, marking your path so that you can follow it back. If it is getting dark or foggy, or snow is blowing, and you don't know where you are, stay put and start making a good camp right away. Your first consideration should be seeking or building a shelter and starting a fire.

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Survival and First-Aid Kits

Every hunter should carry a personal survival kit whenever afield. The things you carry in it should be for emergency use only. The kit may need to be added to, depending on where and when you hunt. You should pack your kit in a belt pouch or fanny pack no matter how short a trip you plan. If you trail a wounded game animal for hours and wind up lost, the survival kit left back at camp or in the car can't help you.

Choosing items for a survival kit depends on you, your area, and the expected weather. Always include things needed to fashion a shelter, build a fire, and signal for help. Here are some strongly recommended items: spare pocket knife, spare compass, plastic whistle, matches in a waterproof container, a second fire making method, fire starter, fishhooks, fishing line, soap, water purification tablets, prescription drugs (if you need them), first-aid kit, collapsible drinking container, a space blanket or large plastic sheet or bag, and nylon cord.

If you enter dry, desert country you will need extra water. Where weather can turn cold, wool longjohns will keep you warm even if they get wet. Be sure to take sunglasses and, if you need them, an extra pair of eyeglasses.

The first-aid class you take will tell you what items you should have in a first-aid kit. Be prepared. You may never need your survival kit or first-aid kit, but if you do, having and knowing how to use them can save your life.

"Survival Rule of 3s"

Although the specific items put into survival kits may vary somewhat, there are certain basic essentials that we all need to survive. These basic needs are often referred to as the *Survival Rule of 3s*. These needs, and the approximate amount of time you can survive without them are:

- Air/oxygen—3 minutes
- Shelter—3 hours
- Water—3 days
- Food—3 weeks

Fortunately, most survival situations do not involve a lack of oxygen. Some types of injuries, and some medical conditions, may interfere with a person's ability to breathe, especially at high altitudes. These types of emergencies will be dealt with in the first-aid course you take.

Shelters and Fires

Second on the list of needs is finding shelter, especially in severe weather. To stay overnight in a survival situation, you will need two things: *shelter* and *fire*. Look for a good, sheltered location. Stay away from areas where rockslides, snowslides, or floods may happen.

Temporary safety under a spruce tree's lower limbs may be a good place to wait out a sudden snowstorm. Dig through snow to get to the base of the tree and use cut or fallen branches to block openings. Use this for temporary shelter only, since building a fire under the tree is not recommended. Not only is there danger of the tree catching fire, but snow melting from the branches may smother your fire.

Remain calm, stay as dry as possible, and don't work so rapidly that you begin to sweat. This could lead to *frostbite, chilling,* or *hypothermia*.

A lean-to is a simple shelter to make. It is open on one side and has a sloping roof/back on the other side. If you have a space blanket in your survival kit, tie or roll one long edge on a sturdy pole placed horizontally between two tree crotches or pair of forked sticks. Dirt can be used to weigh down and seal the bottom edge. Spruce or cedar branch beds eight inches deep will insulate you from cold ground or snow. Any insulation available is better under you than over you.

You can also build a lean-to from branches. Use a horizontal pole between trees or forked sticks and lay evergreen branches against the pole with their butts up and tips down so that rain will run down the sides. Leafy branches should be placed tips down and woven together to shut out the wind.

A lean-to shelter.

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Next, clear an area in front of the lean-to for your fire. If there is snow, use a fire platform of green wood or rocks. Making a rock wall or placing stacked logs on the far side of the fire will help reflect heat into your shelter. Avoid places where snow could melt and fall on your fire or shelter. Your fire should be placed downwind of the shelter.

There are at least five good reasons for building a fire: *for warmth, to dry clothing, for cooking food, as a signal to rescuers,* and for your *mental comfort and a feeling of security.*

Sometimes it is not easy to build a fire, especially when it's cold, the wind is blowing, and the wood is wet. Carry matches in a waterproof container. Fine steel wool, fuzzsticks, candles, and paraffin-coated butcher's cord are some other fire-starters you might carry in your survival kit. Kerosene-soaked sawdust is a good fire starter, because it is safe, flash-proof, and will last for years when properly sealed in a container. Dry grass, bark, dead pine needles, dry leaves, wood shavings, and twigs make good **tinder.** You should stock pile more wood and dry it so you can use it later. Lower branches of trees are often dead and dry. Look for standing deadwood, such as small alders. Old fallen trees might have parts you can tear out. Even wet wood can be split to get dry pieces.

Start the fire with a match, candle, metal match, or butane lighter. Blow gently on the first flames to get the tinder going. Add fuel slowly, so that you will not smother the fire.

Firewood should be kept dry. If your shelter is large enough, stack wood at one end. Keep your fire small, both to save fuel and to keep from setting your shelter on fire.

Water and Food

Water is the next most important survival need. If necessary, you can survive for about 3 days without water. Check your supply of water. Most people need eight or more cups of water each day. You may need more or less than this, depending mostly on the temperature and humidity around you. Look for other sources of water. Rain, dew, ice, and snow can be used. Ice and snow should be melted and warmed, since eating them chills your body quickly.

It is surprising to most people that you can survive much longer without food than without water. Although a healthy human can survive up to 3 weeks without food, you will feel better, and more importantly think better,

Drink hot liquids. Warm yourself and dry your clothes by the fire.

if food is available. A responsible hunter should carry food such as granola bars, energy bars, or other high energy, dried food. If no water is available, however, do not eat dried foods as they will actually remove some body water in digestion.

Signals and Rescue

If you think someone may already be looking for you, there are signals you can use to help them. Remember that *three of anything is a signal for help.* Three shots, three whistle blasts, or three signal fires can help to alert searchers. Do not waste your voice by shouting unless you hear people near you. Three evenly spaced shots work best after dark, when they cannot be mistaken for a hunter shooting at game.

Listen for signs that tell you other people are nearby, such as a chain saw running, heavy equipment, or a car motor. Wait for the noises to stop, then blow your plastic whistle or fire three shots. Don't waste ammunition by shooting too often. Your three signals should be repeated every 15 to 20 minutes. If searchers hear you, they will answer with two signals.

At night, your fire is a signal someone is there. In an area where fires could damage timber, a fire tower watcher or forester may see the blazes. An airplane overhead could spot your fire. During daylight hours, wet or green wood added to a hot fire sends up a thick, white cloud that can be easily seen.

Every back country sportsman should have and know how to use a *signaling mirror.* This is a hand-size, polished metal mirror with a sighting hole in the center.

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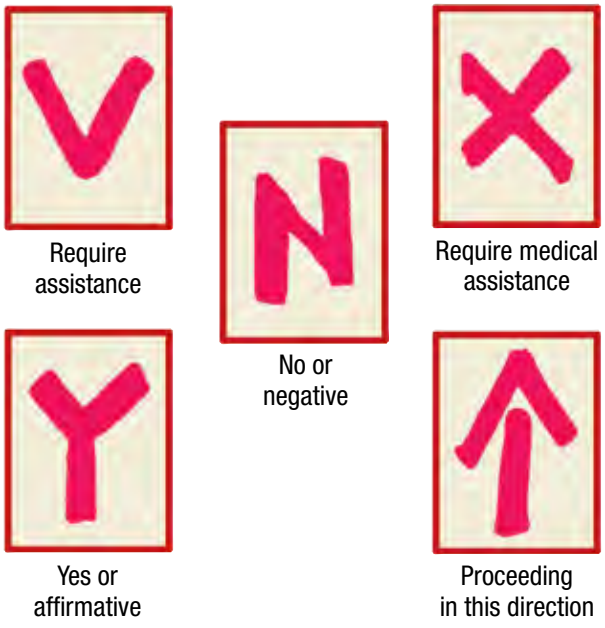

The flash of sunlight off such a mirror can be seen far away. It can be lined up by sighting through the hole to flash a signal toward a firewatch tower (marked on your map) or at an airplane overhead.

Logs, branches, rocks, or footprints in snow or sand may be used to spell out "HELP," "LOST," or "SOS."

It is important that you stay put to wait for rescuers if you have had a response to your signals. Any response to your emergency signal whistles, shots, or shouting tells you that help is on the way. Do not leave your signal area, looking for the rescuers. They will go towards the signal area. If you have left, they may not find you, and you may remain lost. And you may cause someone to become lost or injured while looking for you.

Tell someone where you are going before you leave on your hunt, and then it will be easier for rescuers to find you. If you change your plans, tell someone.

Wilderness First Aid

It has often been said that the most important piece of survival equipment you will have with you is your brain. Faced with a survival situation, especially if injured, you must "use your head to save your hide." Slow down. Only do what you must and do that very carefully. Take care of bleeding and pain first, so that you can think more clearly. STOP. Sit down. Think. Observe. Plan.

As a hunter, it is your responsibility to be able to provide first aid for yourself and others if necessary. First aid is a very complex subject. A first-aid class is just as important as your basic Hunter Education course.

You should take a Red Cross First-aid Class or other nationally recommended training, and learn CPR. Part of what you learn is how to keep from creating hazards to your health while outdoors. You will also learn how to help yourself and others take care of problems you may meet. You should know how to handle bleeding, non-breathing, broken bones, burns, shock, sunburn, and hypothermia. Any short summary of first aid cannot substitute for qualified first-aid training. **Take a first-aid course.**

Hypothermia

Hypothermia means lowered body temperature. It is a silent killer that takes heat from your inner body. Danger comes from not knowing the symptoms of hypothermia or the situations in which it can occur. Hypothermia can start in wet conditions such as rain, snow, or sleet. It can be caused by **overexertion** that brings on sweating. Even humidity in the air can chill you.

Sportsmen wading in rivers or pond edges can fall and get soaked, making hypothermia more likely. A boating accident that puts you in the water can take your life in less than an hour even though you do not drown.

Moisture on brush and trees may make your clothes wet. You may be soaked before you realize it. Good rainwear will keep you warm and dry.

High heat loss areas.

Any *wind*, even that caused by your own movements, can cool down your body. A long, cold boat ride across a lake, or a light mist on a 45-degree day with a gentle wind blowing could both cause hypothermia. If you become wet and chilled, you are in danger.

You can lose body heat and be in danger from hypothermia even when the temperature is 40 to 60 degrees Fahrenheit (4 to 16 degrees Celsius). It does not have to be winter. Wind makes moisture from your body evaporate more quickly. This lowers your temperature.

People in *poor physical condition* are more likely to become hypothermic. **Fatigue** makes it harder for your body to produce heat. Poor planning, such as hiking

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Hypothermia symptoms and first aid

	Mild	Moderate	Severe
SYMPTOMS	• Shivering • Complaints of cold. • Loss of coordination. • Mental withdrawal and apathy.	• Listlessness, mental confusion, refusal to recognize problem. • Uncontrollable shivering. • Slurred speech. • Stumbling.	• Unresponsiveness. • Decreased pulse and respiration. • Cessation of shivering. • Physical collapse.
FIRST AID	• End exposure—get victim out of cold and wet. • Replace wet clothing with dry or add insulation. • Place victim in warm environment. • Offer warm liquids or food only if victim is fully conscious.	• End exposure—cover victim rather than walking him to shelter. • Treat victim gently—avoid unnecessary jostling or movement. • Check victim for other injury, including frostbite.	• Treatment should be attempted only if victim cannot be evacuated to a hospital promptly for professional care. In such a case: • Deliver warmth to the head and trunk of the body by application of warm water bottles, warmed blankets, or another warm body.

too fast for the slowest member of the party, or too far between rest stops, can lead to hypothermia. Poor eating habits do not help you to keep warm. Drugs and alcohol slow the body's reactions. Alcohol makes small blood vessels get larger. This increases blood flow and speeds the loss of inner body heat. Prevent hypothermia by keeping your body warm.

Often, the victim does not realize that he is in danger. A human body has automatic defenses to protect itself. When you begin to get cold, blood goes from your limbs to your inner organs and to the brain to keep you alive. Oxygen to the brain is reduced, making it harder to understand what is happening.

This is one of the reasons you should never hunt alone. You may not recognize the symptoms of hypothermia.

A person with hypothermia loses more heat than he can make. His body cannot make up for heat loss. A victim begins to shiver uncontrollably and loses some control of his arms and legs. He may stumble, or seem confused or drunk. Next the shivering becomes violent, sometimes with muscle spasms. Total loss of body control may follow.

Advanced stages of hypothermia may make a victim's skin turn bluish. His muscles might become rigid, his breathing shallow, and his heartbeat weak.

Hypothermia Prevention

Hypothermia can be prevented if you know its causes and use your head to avoid them.

Your first concern should be to stay dry. If you get wet, get out of the wind and weather, change to dry clothing, build a fire, and get warm.

Next, avoid overexertion which leads to perspiring and fatigue. Set an easy pace that matches the speed of the slowest member of your party. Dress in layers.

Always carry protection from wind. A lined nylon shell or light raincoat that lets your body breathe will help keep breezes from chilling you.

Keep your head warm. The head, face, and neck lose body heat faster than other parts of the body. "If your feet are cold, put your hat on" is a good rule to follow. A bandanna around your neck will keep you warmer and, in case of quick temperature drops, may be tied over your head to keep your ears and the sides of your face warm. Wool mittens help your hands stay warm and one-finger or gun-slit holes will still let you pull a trigger safely.

Wind Chill Temperature Index

Temperature (°F)

Wind (m.p.h.)	Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
	5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
	10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
	15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
	20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
	25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
	30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
	35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
	40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
	45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
	50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
	55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
	60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98
	FROSTBITE OCCURS IN:							30 minutes		10 minutes		5 minutes							

Wind Chill (°F) = 35.74 + 0.6215 **T** - 35.75 ($\mathbf{V}^{0.16}$) + 0.4275**T** ($\mathbf{V}^{0.16}$)
T = Air Temperature (°F) **V** = Wind Speed (m.p.h.)

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Dress in Layers

Proper clothing is important to outdoor users. Wool is very good. It is quiet in the woods and holds in body heat even when wet. A wool/cotton blend is a good choice for longjohns. There are many newer synthetic fabrics and lining materials available commercially that are very effective in keeping you both warm and dry.

Planning trips so that you do not overextend yourself will make your hunting safer and more comfortable.

In cold, wet weather, eat regularly and drink lots of warm liquids. This helps keep you warm. The use of alcohol is not a method for staying warm.

Find shelter from windy, wet conditions. Carry and use your personal survival kit.

It is important to prevent hypothermia, because it may be difficult, if not impossible, to stop once it starts.

Hypothermia Treatment

If you think you have any of these symptoms, or think a hunting friend has them, prompt care must be taken to stop heat loss and regain body heat before things get worse.

Get out of the wet, windy weather. Get dry and warm as soon as you can.

A wet or chilled person must dry his clothing and warm his body as soon as he can. At the very least, clothes should be wrung dry. When a fire can be built, start one right away, then wring out your outer clothes the best you can. Take off inner wear and put your outer clothes back on while wringing the inner layers dry. Get the underwear dry by heating it near the fire, then put it on and heat and dry the outer layer of clothes.

Hypothermia is a killer. The advanced stages of hypothermia are very dangerous. The treatment for these stages should be done only by doctors. You should **take a First-aid course** before going afield to learn how to care for hypothermia and other life-threatening situations.

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OUTDOOR SURVIVAL—Review

1. Why is it important for a responsible hunter to know how to use a compass and map?

_____

_____

2. Name the first things you should do when lost, using the initials STOP.

_____ _____

_____ _____

3. Why should you learn the seven basic survival rules?

_____

_____

_____

4. According to the "Survival Rule of 3s" approximately how long can you survive without:

oxygen _____ water _____

shelter _____ food _____

5. Name five good reasons for building a fire.

_____ _____

_____ _____

_____

6. Name *three* examples of firestarters and *two* examples of good tinder.

_____ _____

_____ _____

_____

7. How many of any loud noise is a signal for help? How many is a correct response?

_____ _____

8. What is "hypothermia" and what are three of its symptoms?

_____

_____

_____

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12 Hunting in Bear and Mountain Lion Country

Preventing Conflicts and Avoiding Confrontations

Bears in Wyoming

All hunters in Wyoming should be alert to the fact that they are hunting in bear country, and in some instances, grizzly bear country.

If you will be hunting in the mountains of western Wyoming, you need to take precautions to minimize the possibility of a confrontation with a black or grizzly bear. Grizzly bears are most likely to be found in the Beartooth, Absaroka, Owl Creek, northern Wind River, Gros Ventre, and Teton Mountains.

Bear Identification

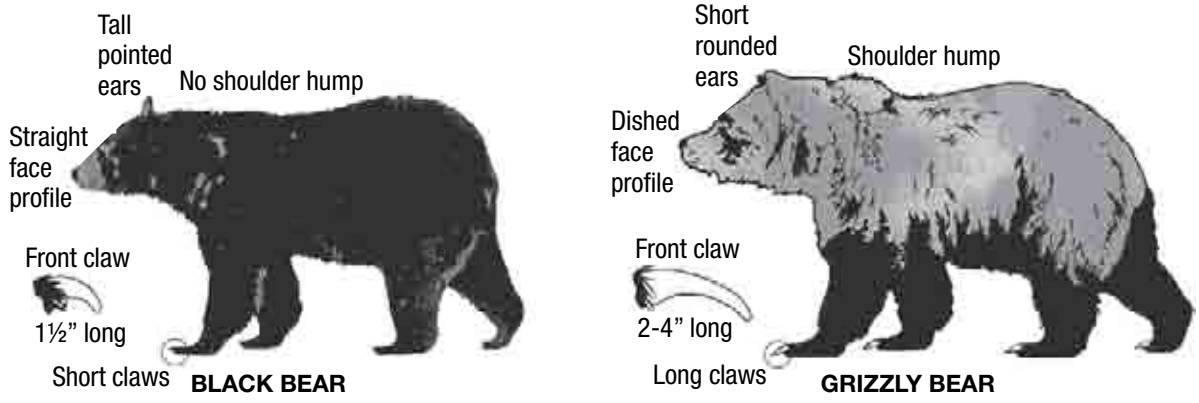
The black bear and the grizzly bear are often in the same areas. Neither color nor size should be used for identification.

Grizzly bears are also called brown bears. Grizzlies will typically have a distinctive hump on their shoulders made of muscles used in foraging and digging. From the side, the face will appear to be dished with a dip or notch between the eyes and the nose. Their claws are typically 2 + inches or more in length, and are gently curved as an adaptation for digging. Although often difficult to distinguish, the grizzly's ears are smaller and more rounded than the black bear. The color may vary from blonde to black. Dark colored grizzlies often have light colored tips on the longer guard hairs.

Black bears have no shoulder hump, although they may appear to when digging. They have a straight face in profile that is not dished like the grizzly. Their claws are relatively short (1+ inches at most) and are sharply curved for climbing trees or tearing logs apart. The black bear's ears tend to be more erect, more pointed, and larger in proportion to the head. Color phases that are typical in Wyoming black bears are brown, cinnamon, and black.

It is a generally accepted fact that black bears are very good tree climbers and will often take that route when alarmed. Grizzly bears, on the other hand, are often good tree climbers when they are young, but usually do

Look for a combination of characteristics



Color and size are sometimes misleading

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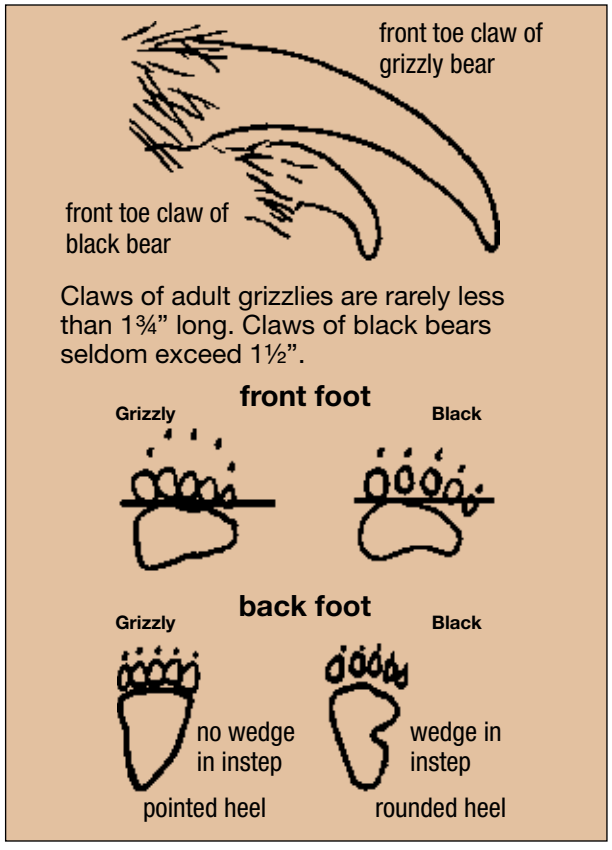
not climb as adults because of their large size and long claws. Adult grizzlies can climb trees with evenly spaced limbs. So if you intend to climb a tree to escape from a grizzly, make sure the tree is stout and you get up at least 20 feet from the ground. Climbing a tree may not be a good option in a black bear confrontation, since black bears climb trees.

Bears Don't Like Surprises

If you are going to travel in bear country, always "Be Bear Aware." Most bear confrontations can be avoided if you let the bear know you are there.

When not hunting, tie bells on your pack or on your shoes and make noise, especially when traveling where visibility and hearing are limited. If you use pack stock, tie bells on them. Horseback riders appear to have fewer problems than people traveling on foot.

Grizzly bears are often found foraging in mountain meadows and on rocky slopes above timberline in summer and early fall. Watch for bears in whitebark pine tree stands near timberline in late fall. Be careful about hunting or traveling in dense "dark" timber, including willow patches, where bears often make their day beds. Bears disturbed in their day bed may charge you in confusion.



Bear Sign

Learn to recognize bear tracks and scat. Grizzly and black bear tracks (front paws only) can be distinguished by drawing a straight line from the bottom of the largest outer toe across the top of the pad, then out beyond the opposite outer toe. If the opposite outer toe lies above or mostly above this line, the track is that of a grizzly.

Bear scats vary in color and size, and should not be used to identify black bears from grizzly bears. Instead, they should be recognized as bear scats and examined to determine what the bear has been eating. Then try to avoid areas where bears may be feeding.

Avoiding or Minimizing Bear Encounters

If you spot a bear before it sees you when traveling or hunting, walk quickly and quietly away. If the bear sees you but seems disinterested, do the same. If the bear becomes interested and begins to approach, observe the bear's head and body movements. Back up slowly, avoid eye contact, and speak in a soft monotone. If the bear stands upright, it is trying to get a better look and smell. Standing upright is not an aggressive display. Never get between a female bear and her cubs; mother bears are extremely protective of their young.

If the bear charges, stand your ground and avoid direct eye contact. Bears often bluff charge by running with their head and ears up and with a stiff legged gait. Aggressive bears will run with their head down and ears back. Should you find yourself being charged by what appears to be an aggressive bear your options are limited. Running from a bear is never an option!

Options

Playing dead should only be done if you are sure you are going to be touched by the bear. In this instance, drop to the ground and lie flat on your belly, interlocking your fingers to cover your neck and head. Be sure to stay in this position until you are sure the bear is gone. If you are wearing a pack, leave it on.

Climbing a tree may be an effective option if you can get at least 20 feet up the tree before the bear reaches the tree. Be extremely cautious of dead or broken branches.

Using a bear deterrent such as bear pepper spray may be the most effective option if certain conditions are in your favor. The spray must be worn on your body in a place where it is immediately accessible, it must be

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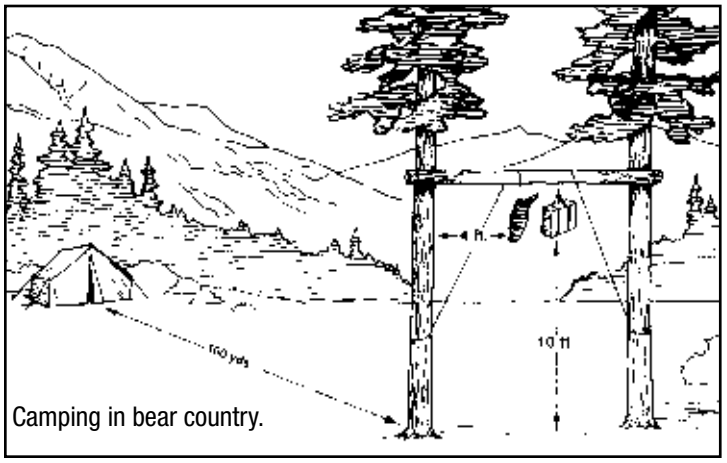

Camping in bear country.

sprayed directly into the bear's face, and the wind must be to your back. Once the bear's attention is directed away from you, immediately leave the area.

Firearms have been used effectively in aggressive encounters, but are only recommended if no other options exist. Wounding a bear may increase the seriousness of the situation.

At the Camp

Keep a clean camp. Some forests in Wyoming have mandatory food storage orders specifying that all foods must be kept unavailable to bears. It is best to always store food and garbage in bear resistant containers. If you don't have a bear resistant food storage container, hang all food, garbage, and other attractants, such as horse or dog food, in a bag, pack, or pannier at least 10 feet above the ground and 4 feet out from the tree trunk. Deposit garbage in a bear proof container when one is available or, better yet, pack it out when you leave.

Sleep a good distance from your cooking area and food storage site. Keep sleeping bags and personal gear clean and free of food odors. Don't sleep with the clothes you wore while cooking.

Don't use perfumes or deodorants. Women are often warned that they should not travel in grizzly country during their menstrual period. There is no evidence that grizzlies are overly attracted to menstrual odors more than any other odor. Proper personal hygiene, such as the use of unscented cleaning towlettes and tampons instead of pads, is recommended.

After The Kill

When you kill a game animal in bear country, field dress the animal, quarter it if needed, and remove the carcass from the area as soon as possible. Separate the entrails ("gut pile") from the carcass as soon as they are removed. Never leave a carcass or gut pile on or near a trail. Hang the carcass out of reach of a bear (at least 10 feet up) if you have to leave it. Always leave a carcass where you can see it from a distance and use special care when returning to it.

For further information on bears, and to test your knowledge on "The Bear Test," visit the Wyoming Game & Fish Department's website on the internet at **http://gf.state.wy.us.**

Mountain Lions in Wyoming

Although not commonly seen, mountain lions are widespread throughout Wyoming. They prefer rocky, brushy areas with steep slopes or cliffs and scattered openings in the trees, but in the past few years have been encountered in more marginal habitats, often close to human habitation. Mountain lion tracks are up to 3 + inches long. The tracks are distinguished from the coyote, dog, or wolf by a distinctive 3-lobed appearance of the heel pad and the absence of claw marks, since the claws are retractable

Mountain Lion Encounters

Since mountain lions are normally shy and stay hidden, any time you see one it should be considered potentially dangerous. This is especially true if the cat does not leave after he sees you, if he is relatively close, or continually disappears and reappears in different sites. *Pay particular attention to the animal's "body language":*

1. It is aware of your presence but paying no attention to you, and is at a relatively safe distance (>100 yards). Be extremely cautious. The probability of attack is slight with appropriate actions. Avoid any rapid movements, running, or loud, excited talking. Stay in a group and keep children close to adults so they are not seen as small prey. Change direction to avoid the animal and walk or back slowly out of the area.

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2. It has its ears up, is watching you closely, is otherwise obviously attentive to your presence, and is about 50 yards away. This is a potentially dangerous situation. The probability of an attack is unpredictable and must be assumed to be likely. Watch the cat at all times and never turn your back. Hold small children and keep larger children behind the adults. Move to a safer location or one above the lion if available. If not carrying a firearm or bow, look for a stick, rocks, or anything else to serve as a weapon and keep it on hand.
3. It is less than 50 yards away, has it's ears laid back, and is staring intensely at you or moves into hiding without any signs of leaving. An attack may occur at any time. Prepare to defend yourself using anything available as a weapon.

Avoiding encounters

Never go out alone. Groups of two or more are less likely to be attacked. If an attack does occur there is a much greater chance of defense.

Keep children near adults. Never let small children hike alone or get out of sight if walking with adults. The small size, rapid and often erratic movements, the higher pitched voice, and instinct of children to run may attractant the lion. If a lion is sighted, have all children move between or behind adults.

Be very careful with **hunting dogs and small pets.** Dogs may actually serve as "bait" to attract the cats.

Do not intentionally approach a lion. Avoid making the animal feel cornered, trapped, or harassed.

Never run in the presence of a mountain lion. This will trigger their natural instinct to chase. Always stand still, facing toward the cat, and making eye contact.

Minimizing Confrontations

Make and maintain eye contact. Face toward any cat that you encounter, keep your eyes directly on it, and do not look away until and unless it is gone. (This will not work with bears.) It keeps you facing the cat and they prefer to attack the head and neck area from the rear.

Do not crouch, bend over, squat, or lie down. An upright human does not resemble any of their usual prey, and also appears large. Although it is quite awkward, pick up small children, or find rocks or sticks for weapons, without bending over or turning around.

Appear as large as possible by raising your arms, opening your coat, placing children on your shoulders, standing on a rock, or any other method that is available. Wave your arms above your head slowly and talk in a loud, firm voice to convince the lion you are not prey and may even present a danger to it.

Find or devise a weapon. A stout walking stick or rocks that are at arm height and you don't have to bend over to pick up work well.

Mountain lion tracks look a lot like any other cat tracks, except they're very big. The claws do not make a mark when the lion is walking.

Fight back if attacked. Any time a lion is within 50 yards of you, has its ears pinned back, is silently moving toward you, or is attempting to sneak around you, it could attack at any time. This is the time to shoot if you have a gun with you. If it is not, use any weapon available. Throw rocks or sticks, yell, growl, and "smile" to show your teeth. If it does attack, fight back with any means available. Never attempt to "play dead" since lions are not trying to scare you away, they are hunting you as a prey animal. Very few people can actually defeat a mountain lion by hand, but you can hopefully make it decide to go look for an easier meal.

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Further Education Opportunities for the Hunter

Many hunters start hunting at a young age with family or friends and continue this tradition throughout their lives. Much of your "continuing education" as a hunter will be learned from these more experienced hunters. The concentration and intensity of your mind, body, and emotions as you face new situations and make decisions based on your own code of ethics becomes a method of self-education.

Books, magazines and journals dedicated to hunting, fishing, and other types of outdoor recreation are excellent sources of information. Numerous interesting hunting, conservation, and other outdoors sites can be found on the internet, and many animal or nature documentaries and programs on television can provide education along with enjoyment. Joining and becoming active in the large number of groups or organizations dedicated to hunting and shooting can be both enjoyable and informative. Types of organizations available, and their names and addresses, can be obtained at libraries, from local game and fish offices, on the internet, or from local members of each group.

Making organized advance hunter education available through state wildlife management agencies is a relatively new idea. Wyoming is planning to offer opportunities for advanced learning in the near future. The goals of this program will be to provide educational experience for the hunter, and also to increase the number of knowledgeable, ethical hunters in the field. For more information on this program, contact the Conservation Education and Information Supervisor, Wyoming Game & Fish Department, 5400 Bishop Blvd., Cheyenne, WY 82006.

Resources

Shooting Sports

4-H Shooting Sports Program
Contact your county extension agent or the 4-H office at your state agricultural college.

Amateur Trapshooting Association (ATA)
601 W. National Rd., Vandalia, OH 45377
(937) 898-4638

Boy Scouts of America
P.O. Box 152079, Irving, TX 75015-2079

National Muzzle Loading Rifle Association (NMLRA)
P.O. Box 67, Friendship, IN 47021
(812) 667-5131
Website: www.nmlra.org

National Reloading Manufacturers Association
Suite 300, 1 Centerpoint Dr.
Lake Oswego, OR 97035
(503) 639-9190

National Sporting Clays Association
5931 Roft Road,
San Antonio, TX 78253-9261
(800) 877-5338/(210) 688-3371
Fax: (210) 688-3014
Website: www.mynsca.com

National Rifle Association (NRA) Competition & Training Division
11250 Waples Mill Rd., Fairfax, VA 22030
(703) 267-1500
Website: www.nra.org

The National Shooting Sports Foundation
Flintlock Ridge Office Center
11 Mile High Rd., Newtown, CT 06470-2395
(203) 426-1320
Website: www.nssf.org

National Skeet Shooting Association (NSSA)
5931 Roft Rd., San Antonio, TX 78253-9261
(800) 877-5338
Website: www.mynssa.com

USA Shooting (USAS)
1 Olympic Plaza,
Colorado Springs, CO 80909
(719) 578-4890

United States Biathlon Association (USBA)
29 Ethan Allen Avenue,
Colchester, VT 05446
(802) 654-7833
Website: www.usbiathlon.org

Hunting

International Hunter Education Association (IHEA)
P.O. Box 490, Wellington, CO 80549
(970) 568-7954
Fax: (970) 568-7955
Website: www.ihea.com

Izaak Walton League
707 Conservation Lane
Gaithersburg, MD 20878-2983
(301) 548-0150
E-mail: general@iwla.org
Website: www.iwla.org

Species/Habitat Conservation

Ducks Unlimited
One Waterfowl Way, Memphis, TN 38120
(901) 758-3825
Website: www.ducks.org

Foundation for North American Wild Sheep
720 Allen Ave., Cody, WY 82414
(307) 527-6261

National Wild Turkey Federation (NWTF)
P.O. Box 530, Edgefield, SC 29824
(803) 637-3106

Pheasants Forever
1783 Buerkle Circle, St. Paul, MN 55110
(612) 773-2000
Website: www.pheasantsforever.org

Quail Unlimited
P.O. Box 610, Edgefield, SC 29824
(803) 637-5731

Rocky Mountain Elk Foundation
P.O. Box 8249, Missoula, MT 59807
(800) CALL ELK

The Ruffed Grouse Society
451 McCormick Rd., Coraopolis, PA 15108
(412) 262-4044
Toll-free: 1-888-564-6747

Waterfowl USA
P.O. Box 50, Edgefield, SC 29824
(803) 637-5767

In Canada

Canadian Wildlife Federation
2740 Queensview Dr.
Ottawa, Ontario K2B 1A2
(613) 721-2286

National Firearms Alliance
Box 1779, Edmonton, Alberta T5J 2P1
(780) 439-1394

Shooting Federation of Canada
45 Shirley Blvd., Nepean, ON, K2K 2W6
(613) 727-7483

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Glossary

A

Action. Assembly which loads, fires, and ejects a cartridge. Types include bolt, lever, pump (slide), semi-automatic, and break-action.

Ammunition. Any powder, shot, or bullets used in rifles, pistols, and shotguns.

Antlers. Bony structures that grow out of bone pads or lumps on the head of animals in the deer family. Antlers are shed annually.

Arrow. Slender shaft, pointed at one end and feathered at the other, for shooting from a bow.

Automatic. Firearm which loads, fires, and ejects ammunition continuously with one trigger squeeze. Often confused with semi-automatic. Machine guns are true automatics.

B

Bag limits. Numbers of wildlife that may be legally taken daily or in a season.

Ballistics. Modern science dealing with the motion and impact of projectiles, especially those discharged from firearms.

Barrel. Metal tube of a firearm through which the bullet or shot passes.

Biological surplus. Numbers of wildlife produced in nature above the carrying capacity of the habitat; those not needed for reproduction of the species.

Biota. All the plants and animals of an area.

Birth rate. Numbers of wildlife born each year per parent species.

Black powder. Granulated powder made of charcoal, sulfur, and salt peter; used in muzzleloaders.

Blind. A natural or artificial structure designed to hide the hunter from the game animal.

Bolt. Operating part of a bolt-action firearm which loads and unloads ammunition. While firing, it contains the cartridge in the chamber.

Boning. Removal of edible meat from a carcass for processing without cutting through the bones.

Bore. Inside part of the barrel on a firearm.

Bow. Device for shooting arrows. Types include straight limb, recurve, and compound.

Bow stringer. Piece of heavy test nylon with a leather pouch at both ends, used for stringing a bow.

Bow string. String on a bow.

Breech. Rear end of a firearm barrel. Modern firearms load from the breech.

Breeding stock. Mature adults needed to reproduce a species.

Broadhead. Arrowhead used for hunting.

Buckshot. A large size of shot.

C

Cable lock. Device inserted through the action that prevents a firearm from working.

Caliber. Measurement of the rifle bore. It is the distance between the lands, usually measured in hundredths of an inch.

Camouflage. Disguise, usually one which makes a person blend in with the background.

Carnivores. Meat-eating animals.

Carrying capacity. Number of wildlife each habitat can support throughout the year.

Carrying positions. Safe ways in which to carry a firearm. Positions include double-hand (ready carry), cradle carry, elbow carry, shoulder carry, and sling carry.

Cartridge. Round of ammunition which includes primer, powder, case, and the bullet or shot. Used for rifles or handguns, cartridges can be either rimfire or centerfire.

Case. Container which holds primer, powder, and the bullet or shot.

Centerfire. Ammunition in which the primer is contained in the center of the base.

Chamber. Enlarged part of the bore into which a cartridge is placed by hand or inserted by the action.

Choke. Bore constriction at the muzzle which controls the spread of the shot and its pattern. Types include cylinder, improved, modified, and full.

Clip. Container which holds ammunition and is attached to the action of a firearm.

Cloven-hoofed. Having hooves that are each split into two parts.

Code of Ethics (Hunter's Code). A set of unwritten rules based on respect for what is safe and fair.

Compass. Instrument for showing direction, especially one consisting of a magnetic needle swinging freely on a pivot and pointing to the magnetic north.

Conservation. Wise use of resources.

Cud-chewers. Animals which, after eating, bring their food up into their mouths to be chewed a second time. Ruminants.

Cylinder. Part of a revolver in which cartridges are loaded or placed.

D

Dabbling duck. See Puddle duck.

Damascus barrel. Barrel of early firearms made of steel ribbons welded together. They are often weak.

Death rate. Numbers of wildlife not surviving during one year.

Discharge. Act of a firearm being fired or going off.

Disease. Illness.

Diving duck. Duck which favors lakes and deep ponds, and which runs along the surface of the water to get airborne. These ducks feed by diving.

Dominant eye. Eye that gives better information to the brain than the other. Master eye.

Draw weight. How many pounds of force it takes to draw the bowstring a certain distance.

E

Endangered species. Species that face extinction in all or a large part of its range, and are protected by law for this reason.

Entrails. Intestines and inner organs.

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Ethics. The set of principles, values, and behavior that you believe is correct.

Ethical. Relating to a set of principles or values. See *moral*.

Exotic species. Species not native to a habitat but which is introduced into that habitat.

Extinction. The death of all animals within a species.

F

Fair chase. Techniques and/or equipment used by a hunter that intentionally allows the quarry a fair chance to escape.

Field dressing. Removing the entrails from game to prevent its meat from spoiling.

Firearm. Tool invented by man to propel a projectile by burning gunpowder.

Firing pin. Metal which strikes the primer of ammunition, starting the firing process.

First-aid kit. Kit containing supplies to be used in medical emergencies.

Flask. Container used to carry black power, but not to load it.

Fletching. Usually three feathers on the end of an arrow shaft. It includes a "cock" feather which is used for alignment.

Flint. Rocks that will spark when struck against steel.

Flintlock. A muzzle loading firearm that uses flint to ignite the priming powder.

Foliage. Leaves; a mass of leaves.

Forearm. Front end of a firearm's stock.

Fouling. Pasty deposit left in the barrel each time a firearm is shot.

Frame. Metal housing that gives handguns their shape.

Frizzen. Piece of metal which creates sparks when struck by the flint. This ignites the flashpan and fires a flintlock muzzleloader.

Fulminate of mercury. Explosive used to ignite gunpowder in early firearms. Ignition begins with a sharp blow to the explosive.

Fur bearers. Small animals covered with fur which are primarily hunted or trapped for their pelts.

G

Game. Wildlife that may be hunted or trapped according to legal seasons and limits.

Game call. A mechanical device or voice technique that attracts game animals toward the hunter.

Game care. Removing the entrails and skin from game to prevent its meat from spoiling.

Game check stations. Checkpoints established by law or regulation where hunters must always stop.

Gauge. Shotgun measurement which is determined by the number of lead balls the exact size of the bore it would take to weigh one pound.

Grip. To grasp firmly; a firm hold on something. Also, the stock of a handgun.

Ground-to-air signals. Emergency rescue signals made on the ground that can be seen from the air.

H

Habitat. Environment that provides everything wildlife needs to live: food, water, cover, space, and arrangement.

Half cock. Certain point between having the firearm hammer in a firing position and in a down position.

Hammer. Part of the action which strikes the firing pin, causing the ignition of ammunition.

Handgun. Firearm having a short barrel and which is usually held at arm's length, rather than at the shoulder, to fire.

Hangfire. Delay in ignition.

HELP. Heat Escape Lessening Posture. Position used by a lone person in the water to increase survival time.

Hen. Female bird.

Horns. Hard, fiber-like material growing around a core of solid bone on the skull of some mammals. With the exception of the pronghorn, horns are not shed.

Huddle. Position used by two or more people in the water to increase survival time.

Hunter orange. Bright orange color which, when worn by hunters, has helped to decrease the number of hunting accidents.

Hunting accident/incident. Any unplanned, uncontrolled action that occurs while using a firearm or bow. This includes 'near misses'.

Hypothermia. Life-threatening condition in which the body loses heat faster than it can produce it.

I

Ignition. Setting fire to the propellant or powder charge.

Illegal. Against the law.

Image. The way others see you because of your actions.

Introduced species. Stocking of wildlife not native to the area/country.

J

Jake. Young male turkey.

L

Lands. Ridges of metal between the grooves cut into a rifle's bore.

Law (statute). A standard of custom or action enacted by a legislative branch of government and enforced by a civil authority.

Lean-to. Shelter which is open at one side and has a sloping roof/back on the other side.

Legal. Based upon or authorized by law.

Limitation. Something that restricts what a person can do.

Limiting out. Taking as much game or fish as the law allows. Also called a full limit.

Lock. Firing assembly of a firearm.

Long starter. Wood or brass rod used to push the ball and patch down the barrel of a muzzleloader.

M

Magazine. Part of a repeating firearm which holds ammunition until it is ready to be fed into the chamber.

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Mammals. Animals with vertebrae (backbones). Mammals produce live young. Female mammals feed their young with milk from mammary glands.

Market hunting. Practice at the turn of the century which allowed unlimited kill of wildlife to be sold for profit.

Master eye. Eye that gives better information to the brain than the other eye.

Matchlock. Oldest style muzzleloader and most elementary form of the rifle.

Maxi ball. Lead projectile used in muzzleloaders. Has a solid base which delivers greater weight for a given bore than with a mini ball or round.

Migratory game. Game which leaves the area in which they are raised to go south for the winter, returning in the spring.

Mini ball. Lead projectile used in muzzle loaders. Invented to offer easier loading for military use.

Misfire. Failure to fire.

Moral. Good or right in conduct or character. See ethical.

Muzzle. End of a firearm barrel from which the bullet leaves.

Muzzle control. Keeping a firearm pointed in a safe direction.

Muzzleloader. Firearm that is loaded through the muzzle instead of the breech.

N

Nipple. Part of percussion cap muzzleloaders which holds the percussion cap. When the cap is struck by the hammer, the ignition process is started.

Nock. To place the fingers in a bow shooting position, holding the bowstring and arrow properly. Also the notch at the end of an arrow.

Non-game. Wildlife not normally hunted.

O

Omnivores. Animals which eat both plants and meat.

Orient. To find a location on a map, or to relate a known position to obvious landmarks.

P

Parasite. Unhealthy form of life feeding on and in wildlife, such as ticks, worms, or flukes.

Patch. Piece of material added to a slightly smaller ball, which cleans the barrel, seals tiny gaps, and makes rifles easier to load.

Patterns. Density and scattering of shot pellets when fired. Patterns are affected by choke.

Percussion cap. Cap placed on the nipple under the hammer of a muzzleloader. The cap explodes when hit, sending the flame to the main powder charge, which fires the firearm.

PFD. Personal Flotation Device. Piece of life-saving equipment worn in water-related sports.

Pistol. A handgun that does not have a revolving cylinder.

Poachers. Those who take game out of season, shoot more than the limit allows, or take tame before or after shooting hours. Poaching is illegal.

Poaching. Taking game illegally.

Point. Sharp end of an arrow. Types include conical, blunt, or broadhead.

Population. All the members of a given species of animal within a defined area.

Population dynamics. Normal increase or decrease in species populations.

Powder horn. Container used to hold black powder, hot to load it.

Predation. Act of predators feeding on prey.

Predators. Animals which live mostly by killing and eating other animal species.

Preservation. Non-use of resources.

Prey. Animals hunted or killed for food by other animals.

Primer. Explosive cap used to ignite the powder when struck with a sharp blow from the firing pin.

Private land. Land that is owned by an individual or a group of individuals.

Privileges. Exceptional benefits which are allowed to individuals or groups and can be controlled, withheld, or withdrawn.

Projectile. Missile which is thrust out of a firearm by force.

Protected species. Species protected by law for any reason.

Public land. Land that is owned by citizens and administered by the government.

Puddle duck. Duck which favors shallow ponds and marshes, and which springs directly into the air to fly. Puddle ducks feed by dabbling or tipping.

Pyrodex®. Chemical substitute for black powder.

Q

Quartering. Separating a carcass between the front and rear legs, and between the right and left sides, often for ease of carrying from the field.

Quiver. Container for arrows.

R

Ramrod. Wood or brass rod used to push the ball and patch down the barrel of a muzzleloader.

Rare species. Species which are small in number and are protected by law for this reason.

Refuges. Suitable habitat managed for the purpose of increasing wildlife numbers.

Regulation. A rule prescribed by a government agency which carries the weight of the law under which it was written.

Repeater. Rifle that can carry more than one cartridge in the magazine, and fire several shots before reloading. Includes bolt-action, lever-action, pump-action, and semi-automatic.

Responsible. Answering for or accounting for your actions.

Revolver. Firearm having a revolving cylinder. Cartridges are placed in chambers in the cylinder. This allows firing in quick succession without reloading.

Rifling. Spiral grooves in the bore of the rifle barrel which cause the bullet to spin upon firing.

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Rights. Powers to which a person has a just claim. Unlike a privilege, a right cannot be taken away from you.

Rimfire. Cartridge in which the primer is in the rim of the cartridge's base.

S

Safe shooting zone (zone of fire). Direction in which each hunter in a group will fire, to be agreed upon before beginning a hunt.

Safety. Mechanism which prevents the trigger from moving or the firing pin from operating. It is a mechanical device which can fail.

Season. Part of the year during which game may be legally taken.

Self control. The learned ability to remain calm, think clearly, and act correctly during times of excitement or stress.

Shell. Container which holds shot and other parts of ammunition for shotguns.

Short starter. Short rod used to press the patched ball just into the muzzle when loading a muzzleloader.

Shot. Balls of lead or steel used to fill a shotgun shell.

Sight. Device on a firearm which helps the shooter to aim accurately. Types include open, peep, and telescope.

Sighting-in. Process of adjusting a rifle's sights so that the bullet hits a target area at a given range.

Skylined animal. An animal that is at or near the top of a hill or ridge.

Smokeless powder. Burnable material used in modern firearm ammunition. It burn quickly and develops more pressure than black powder.

Smoothbore. Firearm without rifling in the bore, usually a shotgun.

Sportsman or Sportswoman. A hunter who obeys all the written and unwritten rules and regulations. A hunter who enjoys the total hunting experience.

Sprue. Small flat side on a muzzleloader ball.

Spurs. Spine-like growths on a bird's wing of leg. Usually only on males.

Stalking. Slow, cautious movement of a hunter after game has been spotted or very fresh signs of game have been seen.

Starvation. Lack of food, leading to death.

Still hunting. Hunting method involving stealthy, silent movement through game habitat with frequent stops to watch and listen for game.

Stock. Wooden, composite (such as nylon or fiberglass), or metal frame that holds the barrel and action.

Succession. Gradual changes to habitat that occur naturally.

Surplus game. Numbers of wildlife above those needed for reproduction of the species. See also biological surplus.

Survival kit. Kit containing equipment to be used for basic survival needs.

T

Tagging. Proper and legal attachment of a tag or coupon to a game animal prior to leaving the site of the kill.

Terrain. The features of a portion of land.

Tinder. Any dry, easily flammable material used for kindling fires.

Tom. Male of some species, for example, the turkey.

Topographic map. Map with grids, showing details such as roads, elevation, rivers, and types of vegetation.

Tracking. The ability to identify, interpret, and follow signs of an animal's movements; this is especially important if the game has been wounded.

Trap. Device used for trapping an animal. Types include longspring, coilspring, underspring, leghold, body grip, and box trap.

Tree stand. Platform mounted in a tree on which a hunter waits for game to come within range.

Trespassing. Going on private property without the owner's permission. Trespassing is illegal.

Trigger. Device that starts the firing process on a firearm.

Trigger guard. Part of a firearm that protects the trigger from accidentally being released.

U

Unlawful. Against the law.

Upland birds. Chicken-like birds with short rounded wings and heavy bodies, such as grouse, pheasant, quail, and turkeys.

V

Varmints. Huntable animals regarded as troublesome.

Vital areas. Areas on an animal containing vital organs, especially the heart, lungs, and liver within the ribs of the chest cavity. Vital areas offer the best chance of a quick, clean, rapidly fatal shot.

W

Warm-blooded. Having a natural constant internal body temperature.

Waterfowl. Water bird or birds, especially those that swim. Ducks and geese are examples.

Wattles. Fleshy growths beneath the head of a male turkey, on either side of the neck.

Wheellock. Early muzzleloader with a grooved wheel wound tight by a spring to produce sparks. When sparks shot into the pan, they ignited the powder.

Wildlife. Non-domesticated animals, including mammals, birds, and fish, which may be hunted as controlled by law.

Wildlife management. Wise use and manipulation of renewable wildlife resources. It is a field of study based on scientific fact.

Z

Zone of fire (safe shooting zone). Direction in which each hunter in a group will fire, to be agreed upon before beginning a hunt.

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Front cover: pronghorn;
inside front cover: mule deer;
inside back cover clockwise from left: bird hunters, pheasant, Merriam's turkey, blue grouse, drake and hen mallard, and young hunter; back cover: bull elk.
All photos by LuRay Parker.

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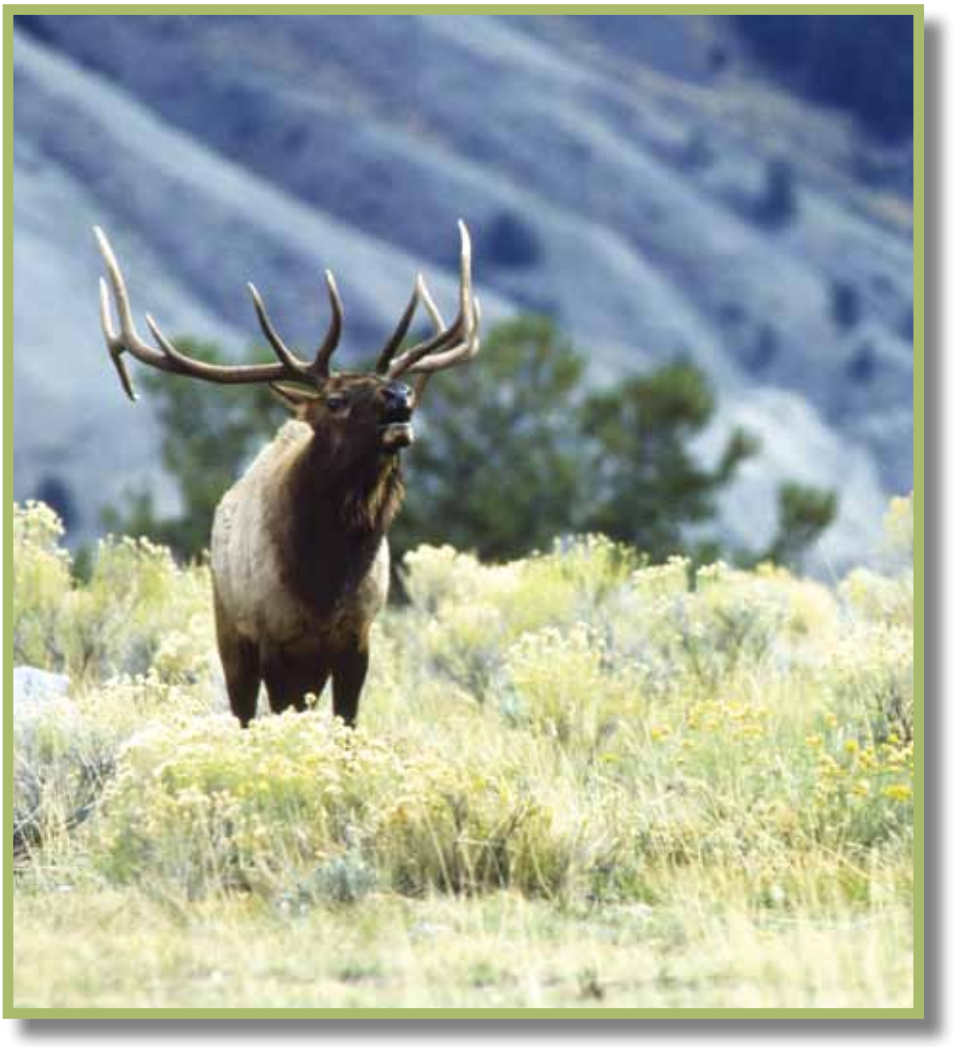

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